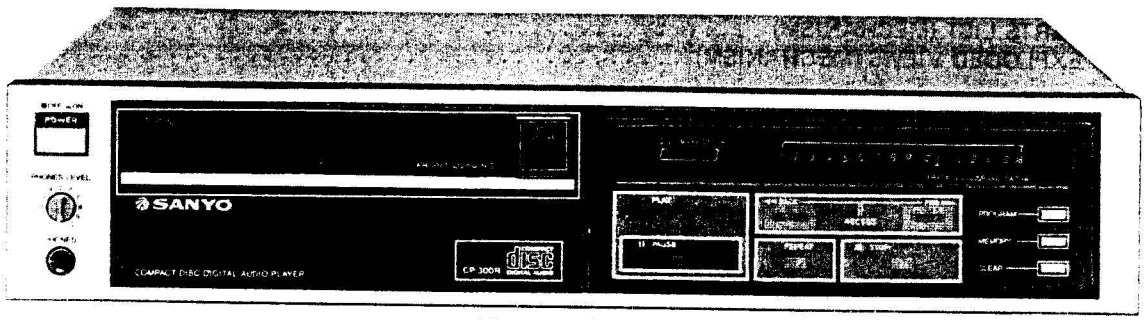
SERVICE MANUAL

COMPACT DISC PLAYER

SANYO

CP300
CP300X
(EUROPE)



(SILVER)

SPECIFICATIONS

NOTE:

The below mentioned specifications are mainly based on the IHF measurements standard. They can therefore not directly be compared with specifications based on the DIN standard or other standards.

Audio

Channels	2 channels
Frequency response	5 – 20,000 Hz
Dynamic range	greater than 96 dB
Channel separation	92 dB (1 kHz)
Distortion	0.003% (1 kHz)
Wow and flutter	Undetectable
Outputs	Output: 2 V/470 ohms Phones: 7.8 mW (at 8 ohms) (impedance range: 8 ohms – 10 kohms)

Signal format

Sampling frequency	44.1 kHz
Quantization	16 bits linear/channel
Transmission rate	4.3218 Mbit/sec.

Pickup

System	Objective drive system light pickup
Light source	Semiconductor laser
Wave length	790 nm

General

Power supply	AC 110/220 V, 50 Hz
Power consumption	35 W
Dimensions (approx.)	420 (W) x 88 (H) x 320 (D) mm (16-1/2" x 3-1/2" x 12-19/32")
Weight (approx.)	6.5 kg (14 lbs. 5 ozs.)

– Specifications and design subject to change without notice.

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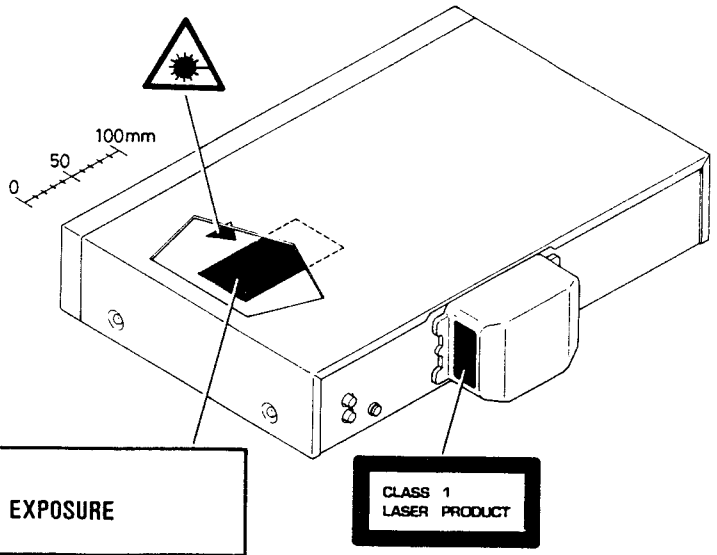
	SCHEMATIC DIAGRAM	4	(SYSCON & KEY SW.)

1. LASER BEAM SAFETY PRECAUTIONS

(1) A pick-up that emits a laser beam is used in this compact disc player.

CAUTION – USE OF CONTROLS OR ADJUSTMENTS OR PERFORMANCE OF PROCEDURES OTHER THAN THOSE SPECIFIED HEREIN MAY RESULT IN HAZARDOUS RADIATION EXPOSURE

LASER OUTPUT – – – – – 1.0mW Max. (CW)



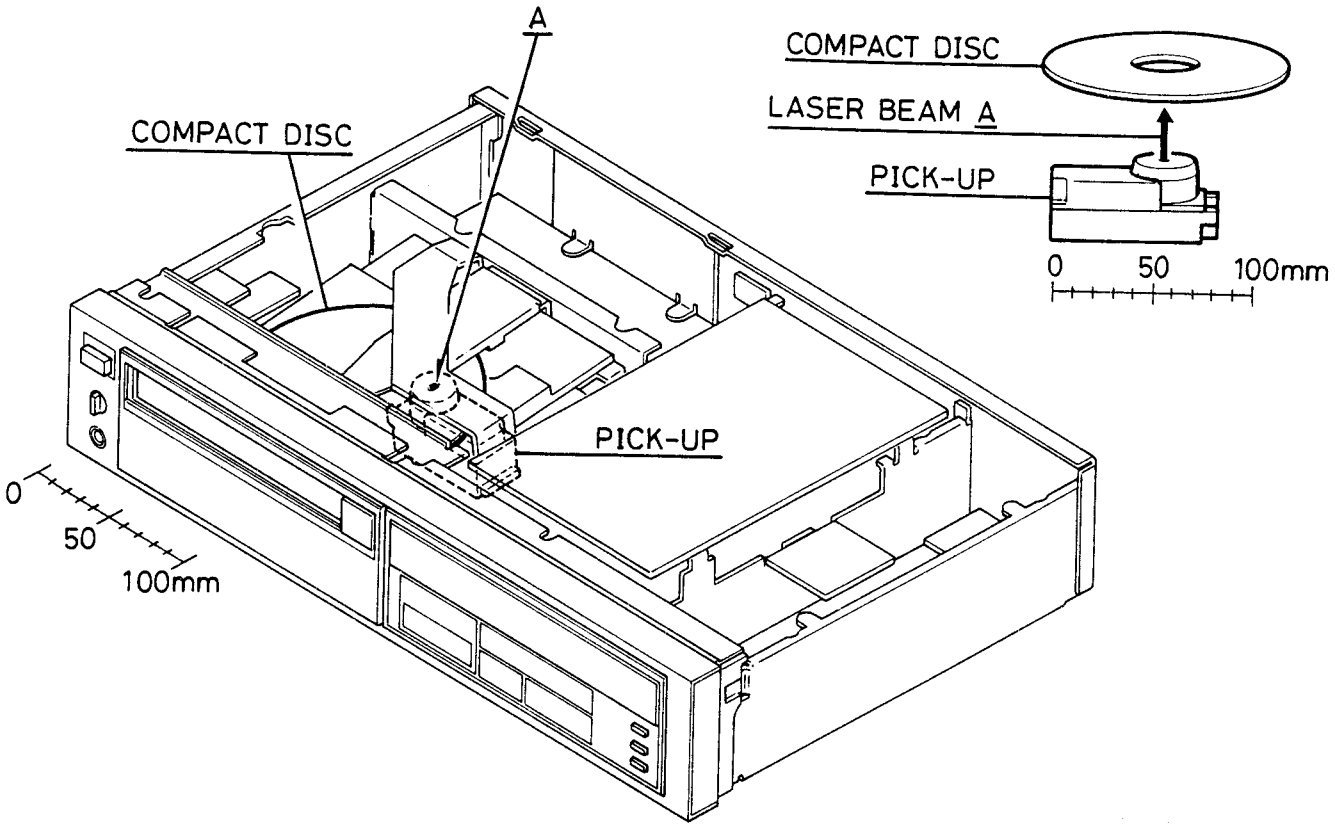
CAUTION–INVISIBLE LASER RADIATION
WHEN OPEN AND INTERLOCKS DEFEATED AVOID EXPOSURE TO BEAM.

ADVASEL–USYNLIG LASER STRAALING VED AABNING
NAAR SIKKERHEDS AFBRYDER ER UDE AF FUNKTION.
UNDGAA UDSÄTTLSE FOR BESTRAALING.

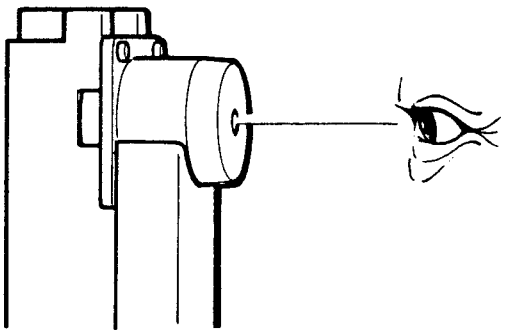
VARNING–OSYNIG LASERSTRÅLNING NÄR DENNA DEL ÄR
ÖPPNAD OCH SPÄRR ÄR URKOPPLAD.
STRALEN ÄR FARLIG.

VORSICHT! UNSICHTBARE LASERSTRAHLUNG TRITT AUS.
WENN GEÖFFNET UND SICHERHEITSVERRIEGERING ÜBERBRÜCKET IST.
NICHT DEM STRAHL AUSSETZEN!

(2) The laser beam is emanated from the location shown in the figure.



If the disc cover is removed in order to perform service, the pickup is exposed.
Do not look at the pickup with the power switch ON.



Do not look directly at the laser beam coming from the pickup or allow it to strike against your fingers, skin, etc.

Do not apply power if there is a broken part in the laser output section of the pickup.

(3) Description of safety interlock circuit.

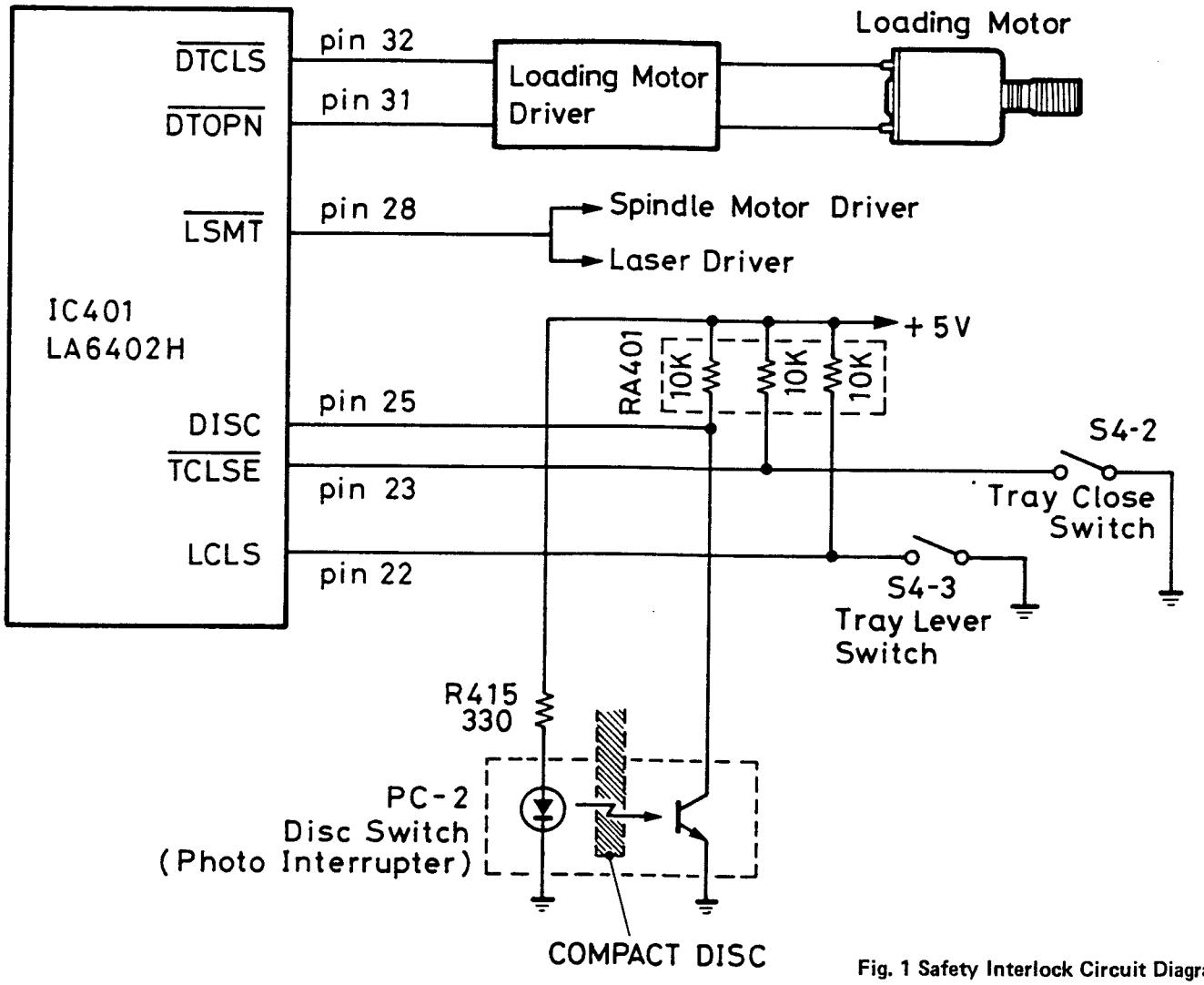


Fig. 1 Safety Interlock Circuit Diagram

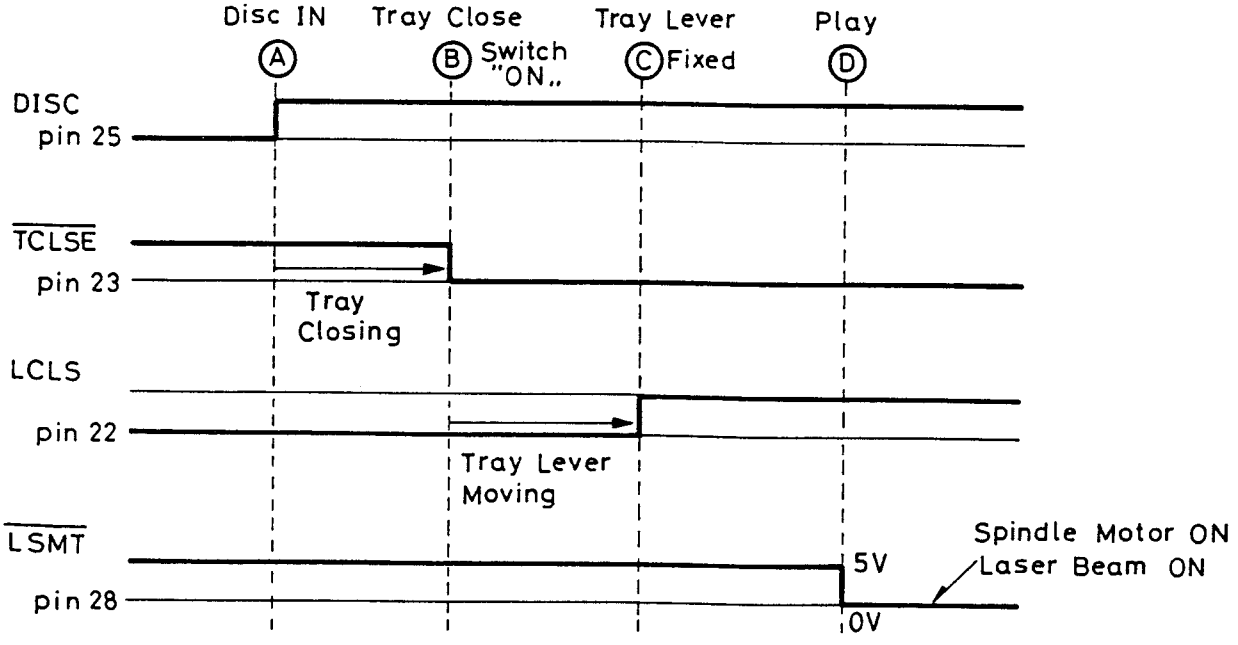


Fig. 2 Time Chart of IC pins

Description of Fig. 1 : (IC401 : microcomputer IC)

LCLS (pin 22) : Turns high when the disc tray is in the set and the shutter is completely closed. (HIGH active)

$\overline{\text{TCLSE}}$ (pin 23) : Turns low when the tray is drawn into the set and just before the shutter begins to move. (LOW active)

DISC (pin 25) : Indicates whether a disc is in the disc tray or not. (HIGH active)

$\overline{\text{LSMT}}$ (pin 28) : Puts out a signal that switches ON the spindle motor and laser beam. (LOW active)

$\overline{\text{DTOPN}}$ (pin 31) : Causes the loading motor to rotate in the direction necessary to eject the disc tray from the set. (LOW active)

$\overline{\text{DTCLS}}$ (pin 32) : Causes the loading motor to rotate in the direction necessary to pull the disc tray into the set. (LOW active)

Operation description

a. Assume that there-is no compact disc in the set.
b. Press the POWER button.
c. Press the OPEN/CLOSE button.
d. The disc tray will come out of the set.
e. Place a disc on the tray. Current will stop flowing the the phototransitor of the photointerrupt in Fig. 1.
The disc terminal (pin 25) of IC401 becomes "H" (HIGH). (Fig. 2 (A))
f. Press the OPEN/CLOSE button again. The $\overline{\text{DTCLS}}$ terminal (pin 32) of IC401 becomes "L" (LOW).
(The $\overline{\text{DTOPN}}$ terminal (pin 31) of IC401 is maintained at "H" (HIGH).) The loading motor starts rotating, and the disc tray is drawn in to the set.
g. The disc tray moves horizontally into the set, and the TRAY CLOSE switch (S4–2) becomes ON.
The $\overline{\text{TCLSE}}$ terminal (pin 23) becomes "L" (LOW). (Gig. 2 (B))
h. Next, the front surface of the disc tray is pulled down, and at the same time, the shutter is lifted up.
This completes the loading operation. The LSLS terminal (pin 22) of IC401 becomes "H" (HIGH). (Fig. 2 (C))
i. When the any of control button (PLAY, PAUSE, SEARCH) is pressed, the $\overline{\text{LSMT}}$ terminal (pin 28) of IC401 becomes "L" (LOW), and the spindle motor begins to rotated. (Fig. 2 (D))

Summary

a. Compact disc is in the set.
b. Disc tray is in the set.
c. Control button (PLAY, PAUSE, SERCH) is depressed.

If all of these conditions are not satisfied, the laser beam will not be emanated from the pick-up.

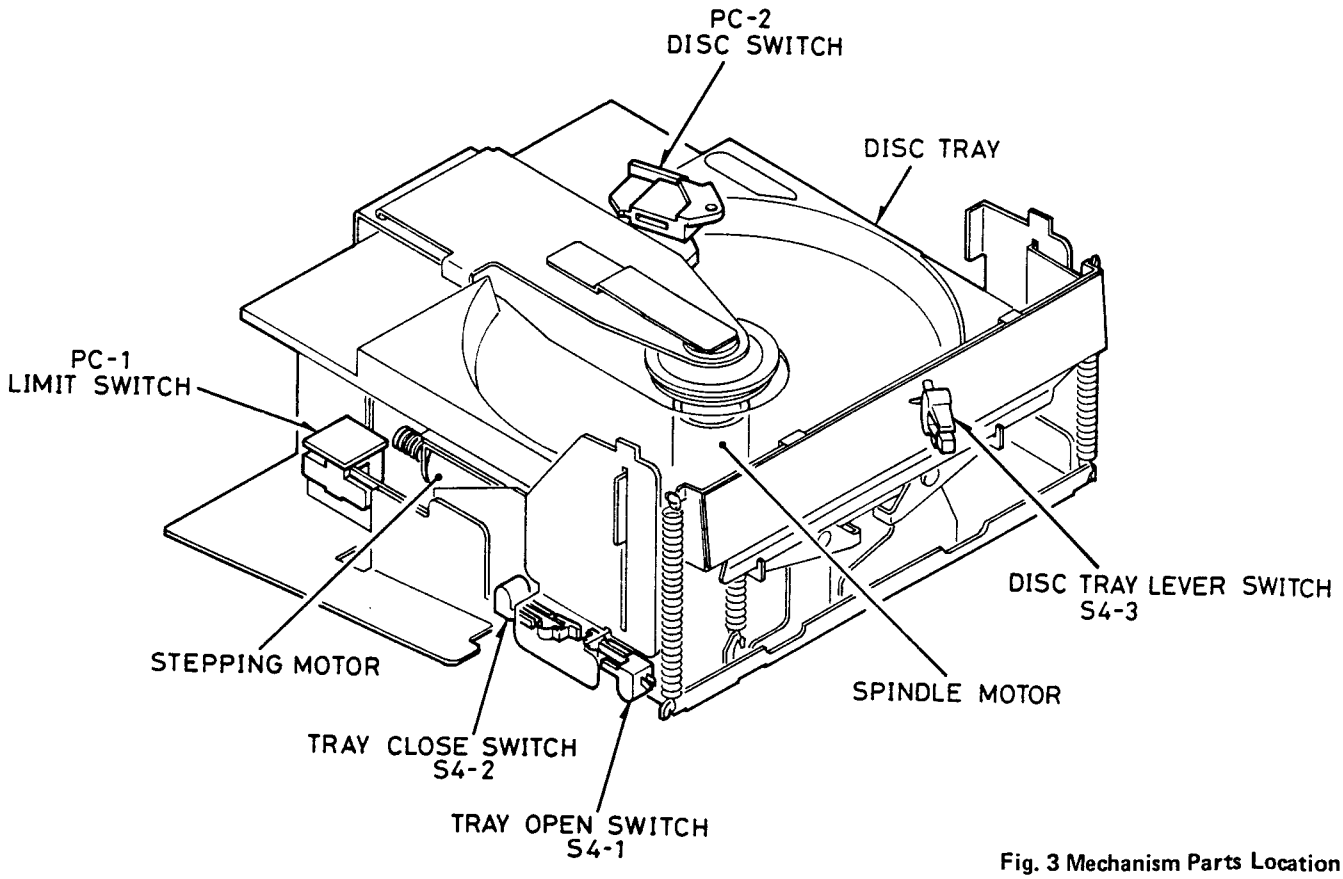
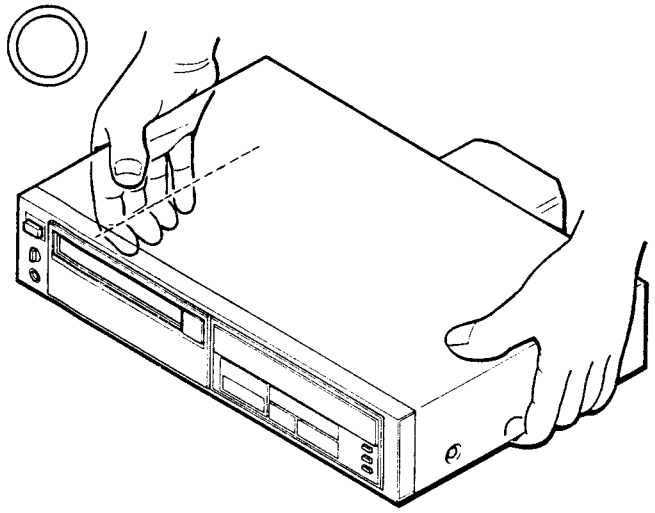


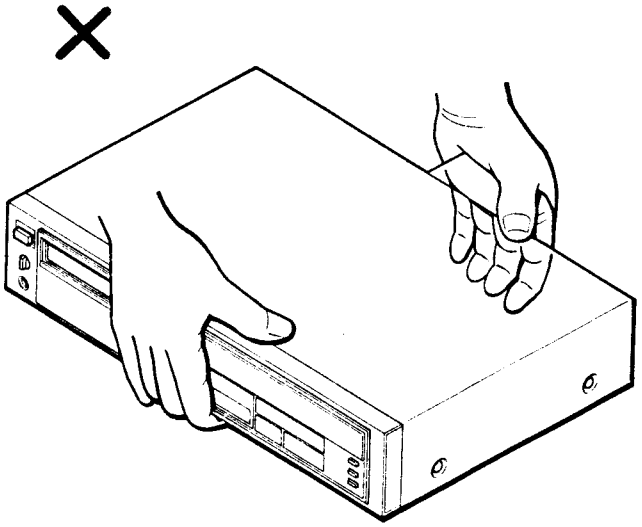
Fig. 3 Mechanism Parts Location

2. HANDLING OF THE COMPACT DISC PLAYER

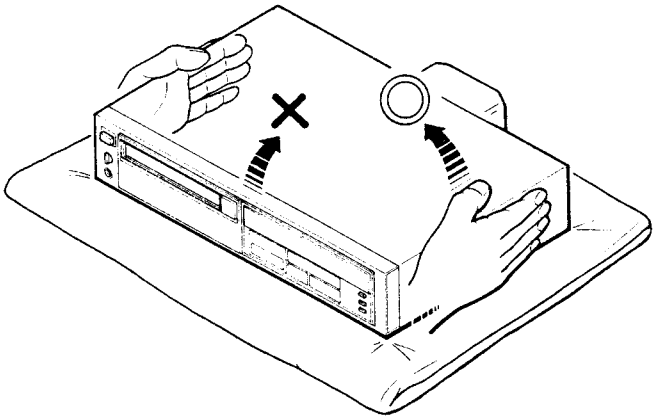
(1) Handling

a. The compact disc player houses parts that must carry out very precise functions, and therefore you should pay particular attention to these basic procedures when transporting and unwrapping the set.
When lifting up the set, do not fouch either the heat sink or power transformer cover.



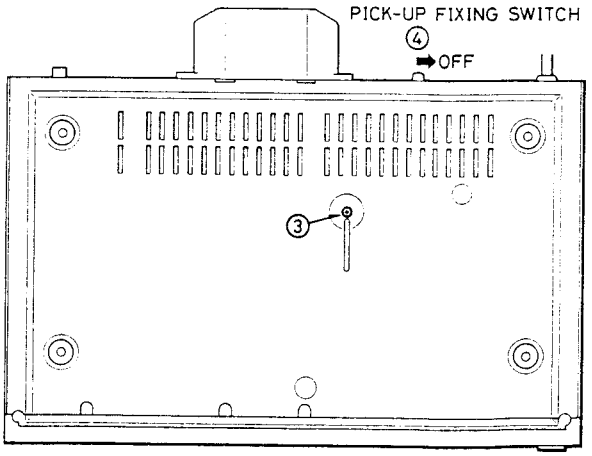


b. The delicate pick-up moves forward and backward, and so it is sbsolutely necessary that the set not be tumed over from front to back. When turning over the set, be sure to do so by lifting the right side and turning it from right to left.



(2) Unpacking

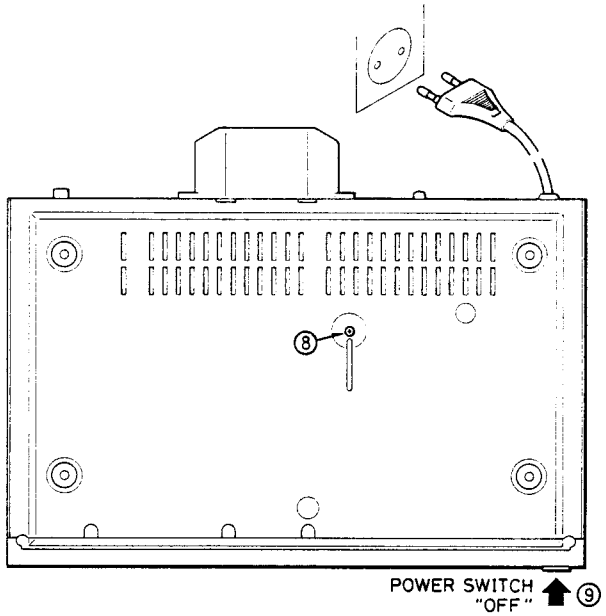
a. Lay a soft cloth on a table to place the set on.
b. By carefully following step 2. —— (b.), turn the set over and place it on the soft cloth.
c. Remove the shipping screw (red). (③)
d. Switch OFF the pick-up fixing switch. (④)
e. Gently turn the set over by lifting the right side up and turning it from right to left.
f. Plug in the power cord and push ON the POWER button.
g. Press the OPEN/CLOSE button, and set a disc in place.

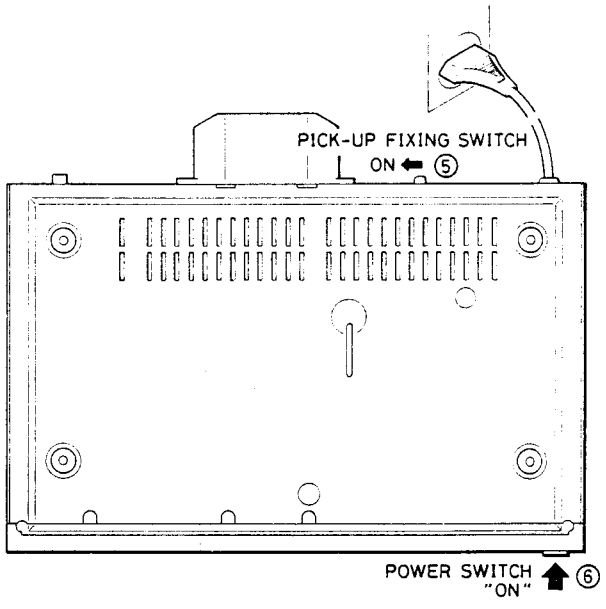


(3) Shipment

a. Remove the compact disc if there should be one in the set.
b. Switch the power OFF, and pull out the power plug.
c. Lay a soft cloth on a table to place the set on.
d. Gently turn over the set, and place it on the cloth.
e. Turn ON the pick-up fixing switch. ((5))
f. Plug in the power cord and turn ON the POWER button. ((6))
g; The bracket that holds the pick-up will start to move. When it comes to the position of the screw hole on the bottom lid used for shipping screw, it will automatically stop.
h. Insert and tighten the shipping screw (red). ((8))
i. Push the POWER button OFF, and unplug the power cord.

NOTE: When the pick-up is moving in step (g.) do not touch the pick-up fixing switch. If the pick-up fixing switch is turned off in the midst of the pick-up is moving, the pick-up will stop part way, and the circuit (micro-computer) will work to stop it from moving again. If this should happen, Turn OFF the POWER button and turn it ON again, and the operation in (g.) will start.

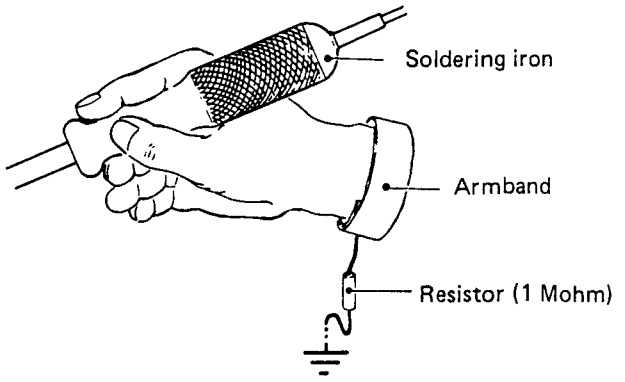




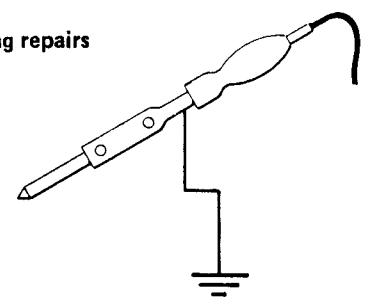
3. BEFORE REPAIRING THE COMPACT DISC PLAYER

(1) Preparations

a. Many ICs, LSI and the pick-up (laser diode) are used in the compact disc player. These components are sensitive to static electricity, and might be damaged by static electricacity or high voltage, so particular care should be taken regarding this point.
b. Many precision componets and the lens are used in the pick-up.
Never attempt to make repairs, or to store parts, where the temperature or humidity is high, where magnetism is strong, or where there is much dust.



(2) Notes regarding repairs



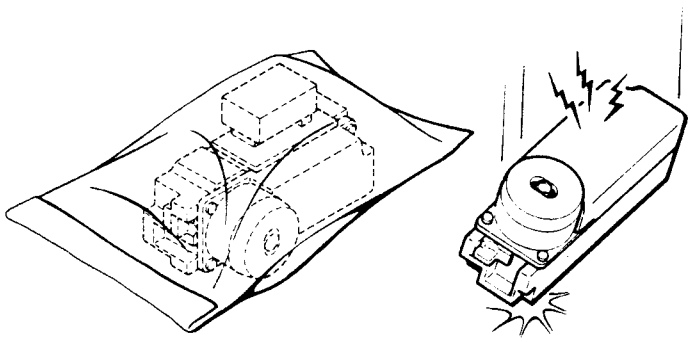
a. Be sure to first disconnect the power plug before attempting to replace any component.
b. All tools, instruments, etc., used for measuring must be grounded.
Grounding can be accomplished by using a conductive metal sheet on the work bench.
c. To prevent AC leakage of the soldering iron, ground its metal part.
d. Repair personnel must be grounded.
e. Do not look directly at the laser beam coming from the pick-up or allow it to strike against your fingers, skin etc.

4. HANDLING THE PICK–UP

(1) Shipping and storage cautions

a. The pick-up must be stored in a conductive bag until immediately prior to its use.

b. Do not drop it or subject it to impacts.



Conductive bag

(2) Repair cautions

a. Be sure to carefully follow the instructions and caution " BEFORE REPAIRING THE COMPACT DISC PLAYER ".

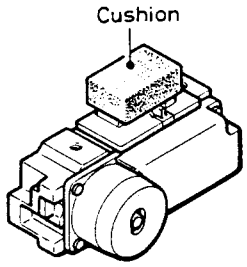
b. The precautions below have been taken in order to prevent damage to the pick-up due to static electricity during transportation.

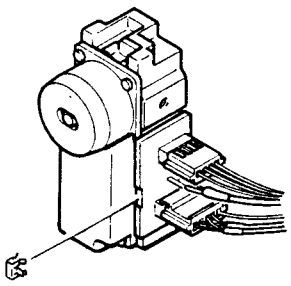
(a) It is in a conductive bag.

(b) A conductive "cushion" is attached at the printed-circuit board terminals. Remove this cushion before connecting the socket.

(c) A clamp pin is attached to the laser diode terminals for short-circuiting.
Do not remove this clamp pin until all steps for replacement of the pick-up have been completed.

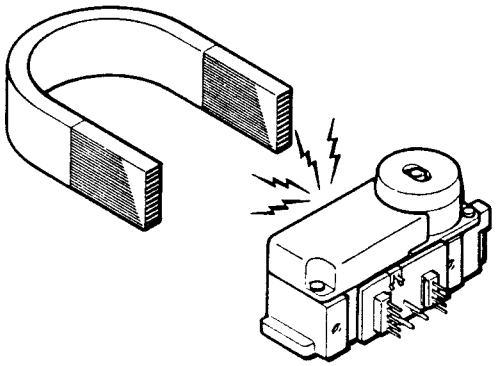
Conductive cushion attached over terminals



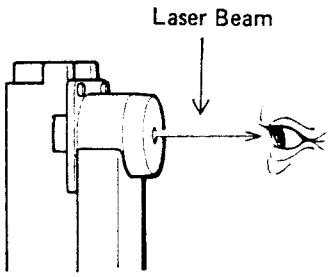


Clamp pin for short-circuiting

c. A strong magnet is used in the pick-up.
Do not bring a magnet or other magnetized object near to it.



d. Eyes may be injured if the laser beam enters.
Take great care to be absolutely sure that the laser beam never enters the eyes. .
Do not apply power if there is a broken part in the laser output section of the pickup.

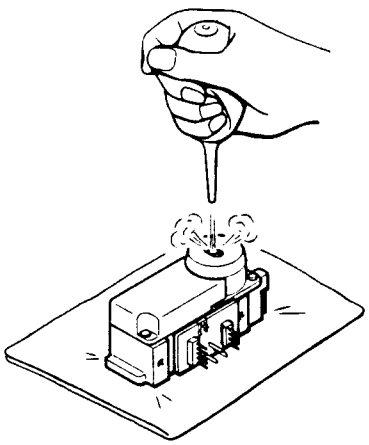


Do not look directly at the laser beam coming from the pickup or allow it to strike against your fingers, skin, etc.

e. Cleaning the lens

(a) If dust gets on the lens, clean it away by using an air brush such as used for a camera lens.

(b) The lens is held in place by a spring.
If the center of the lens is dirty, carefully clean by applying a lens cleaning liquid on a cotton swab or similar soft material, and using this to clean, taking care not to bend the lens spring.



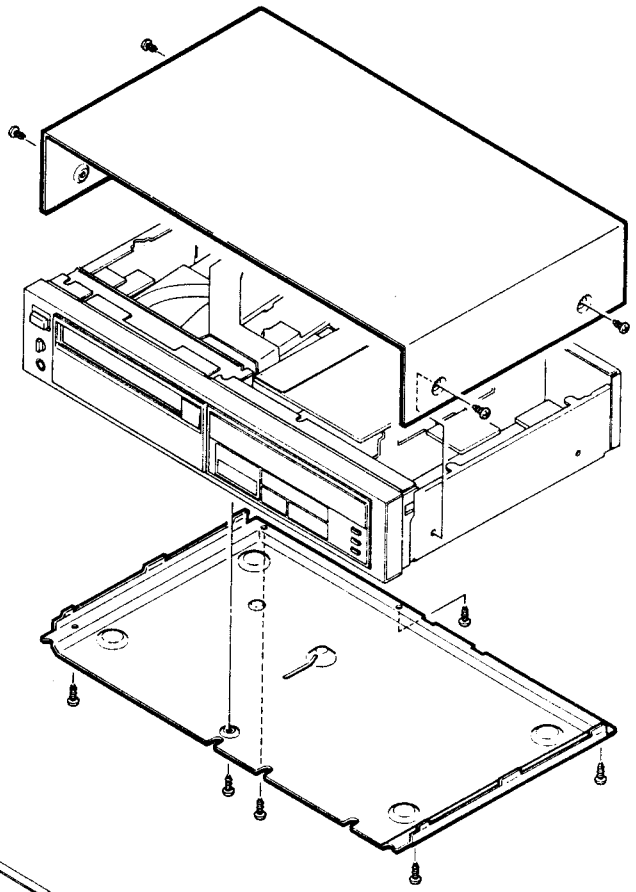
f. Do not attempt to disassemble the pick-up.

5. HOW TO DISASSEMBLE THE UNIT

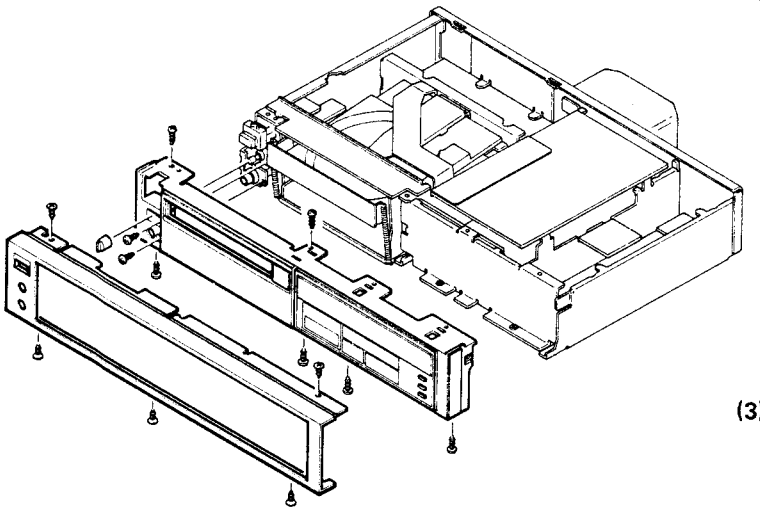
(1) REMOVAL OF CABINET & BOTTOM LID

a. Remove the compact disc if there should be one in the set.

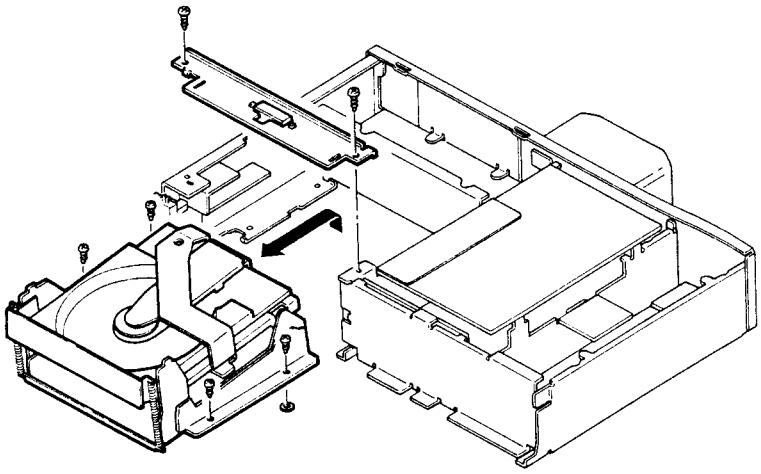
b. Switch the power OFF, and pull out the power plug.



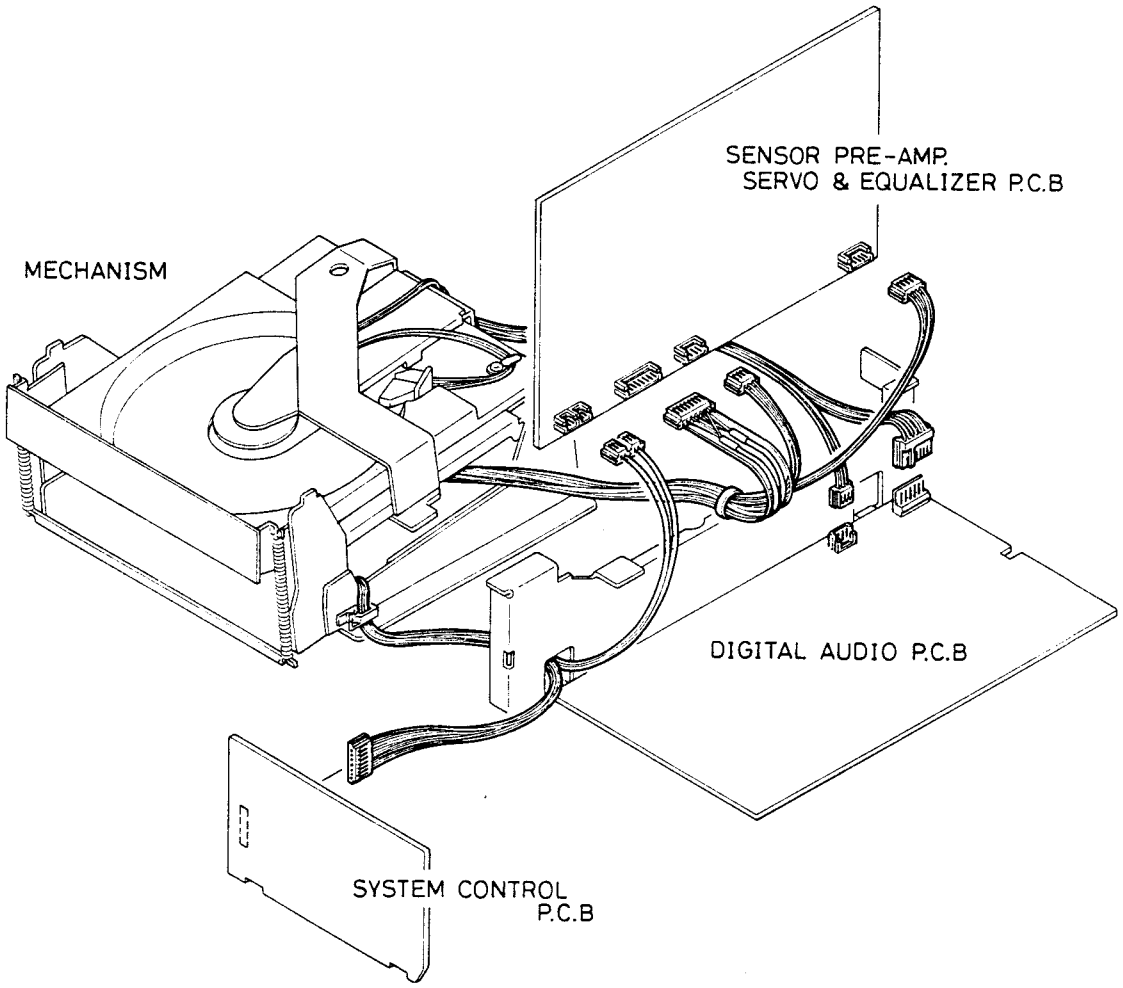
(2) REMOVAL OF FRONT PANEL



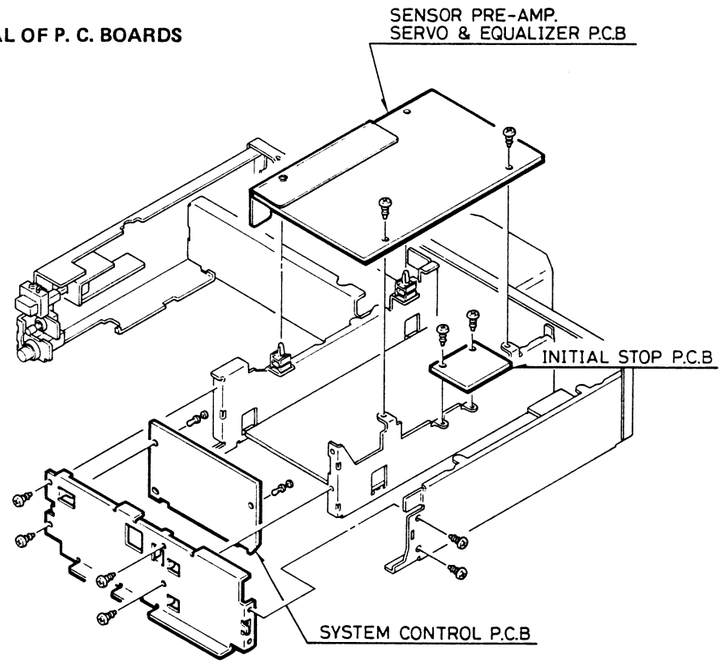
(3) REMOVAL OF MECHANISM

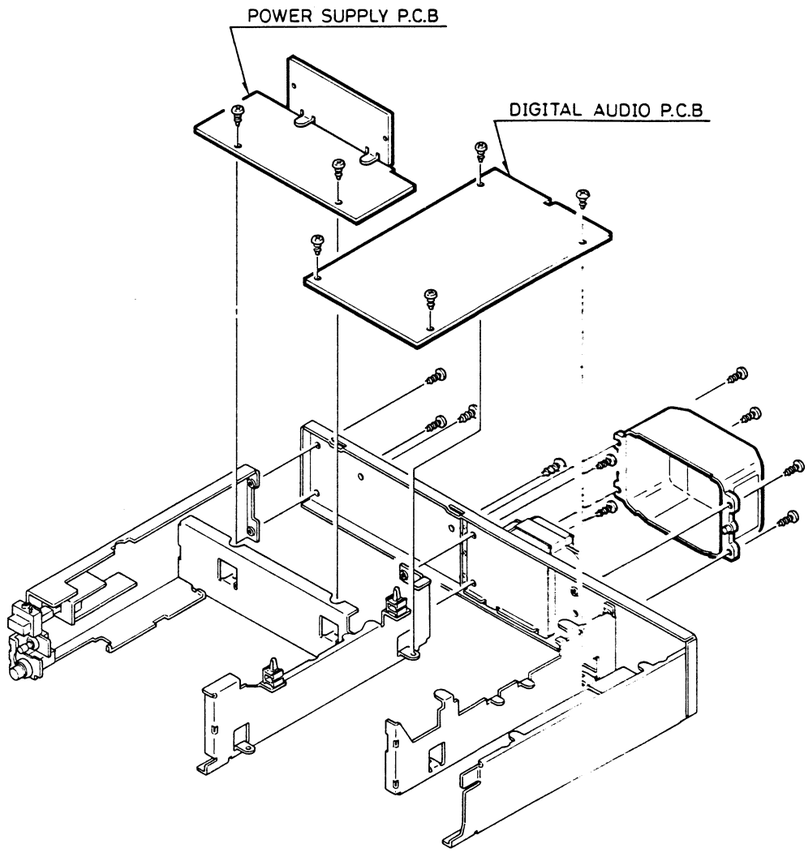


(4) MECHANISM CONTROL CONNECTIONS

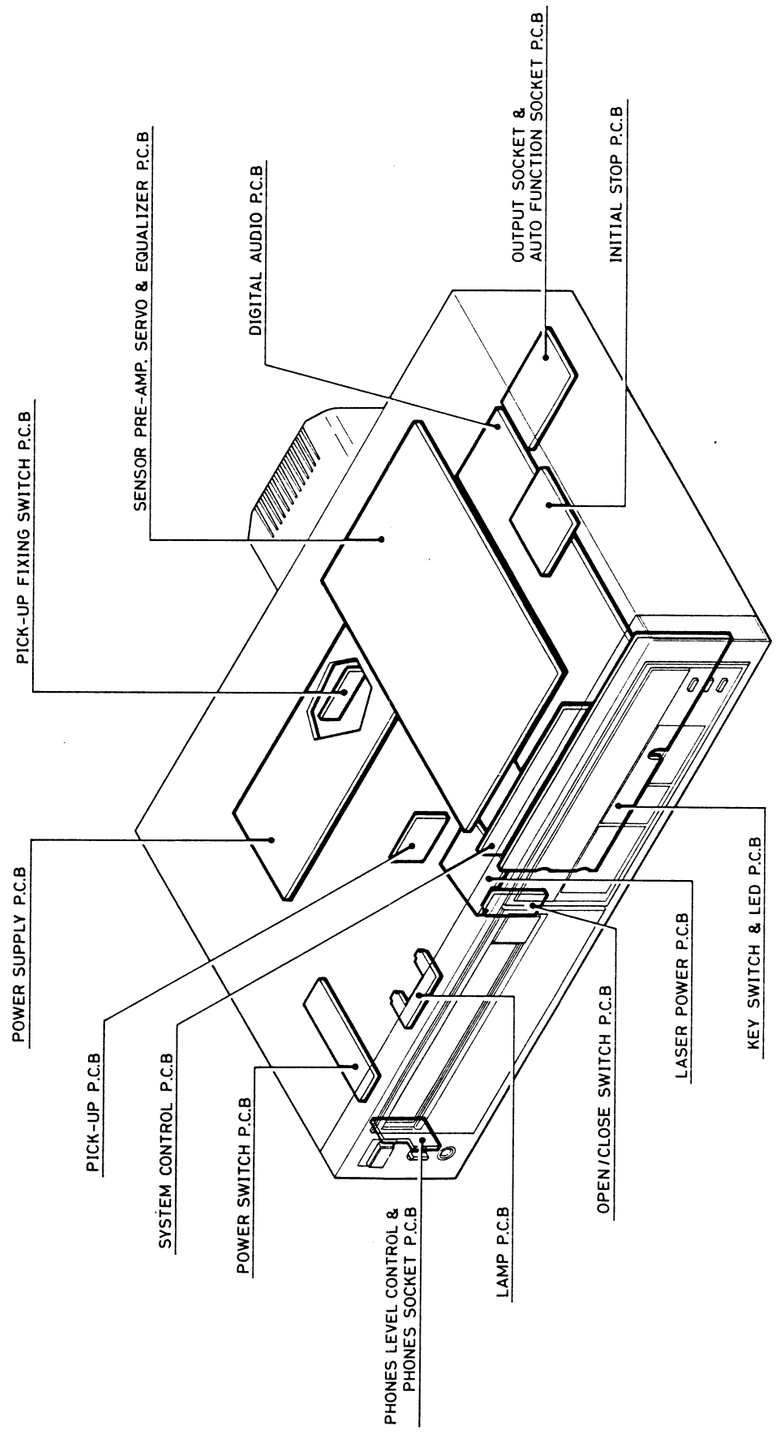


(5) REMOVAL OF P. C. BOARDS

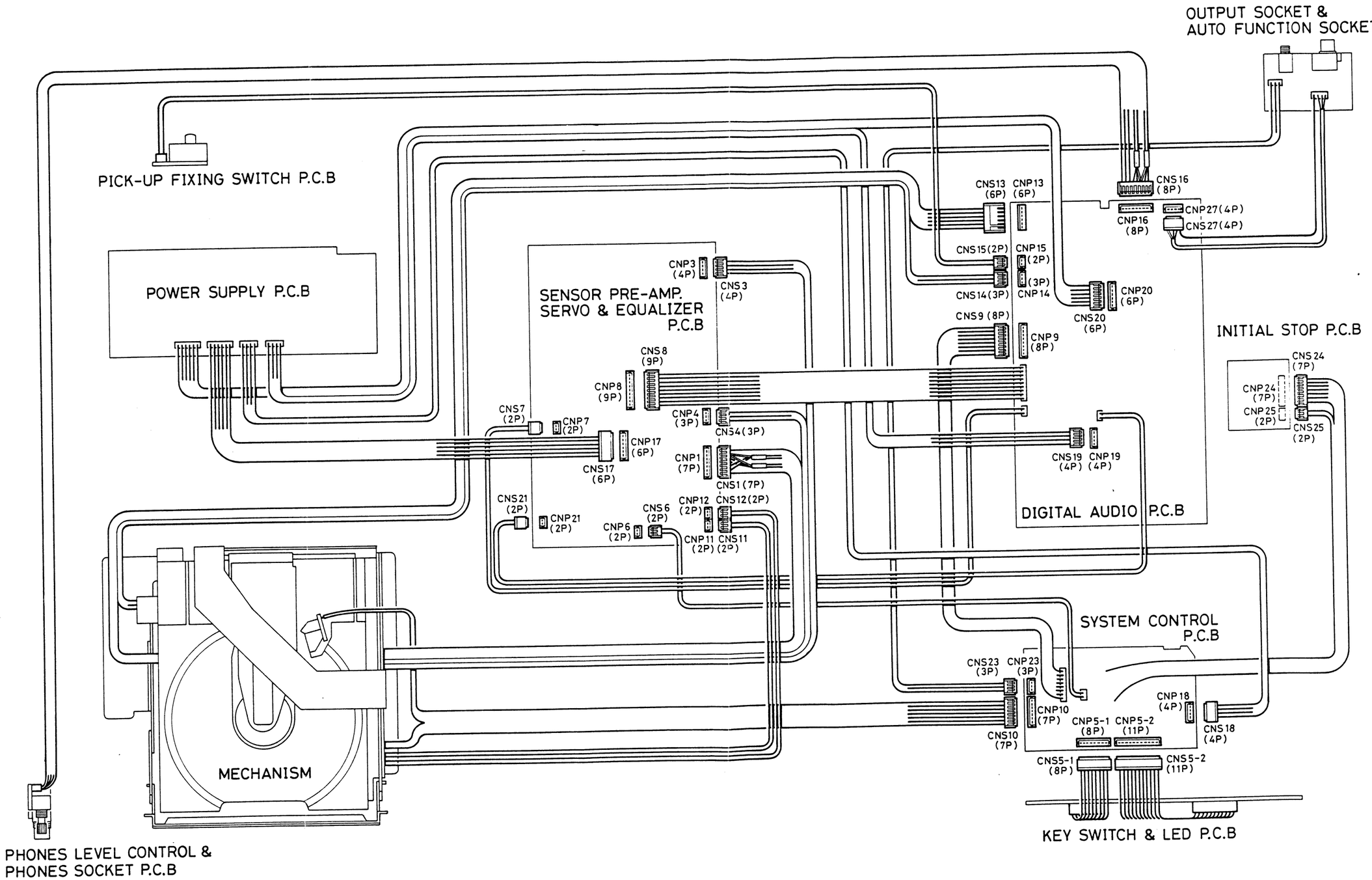




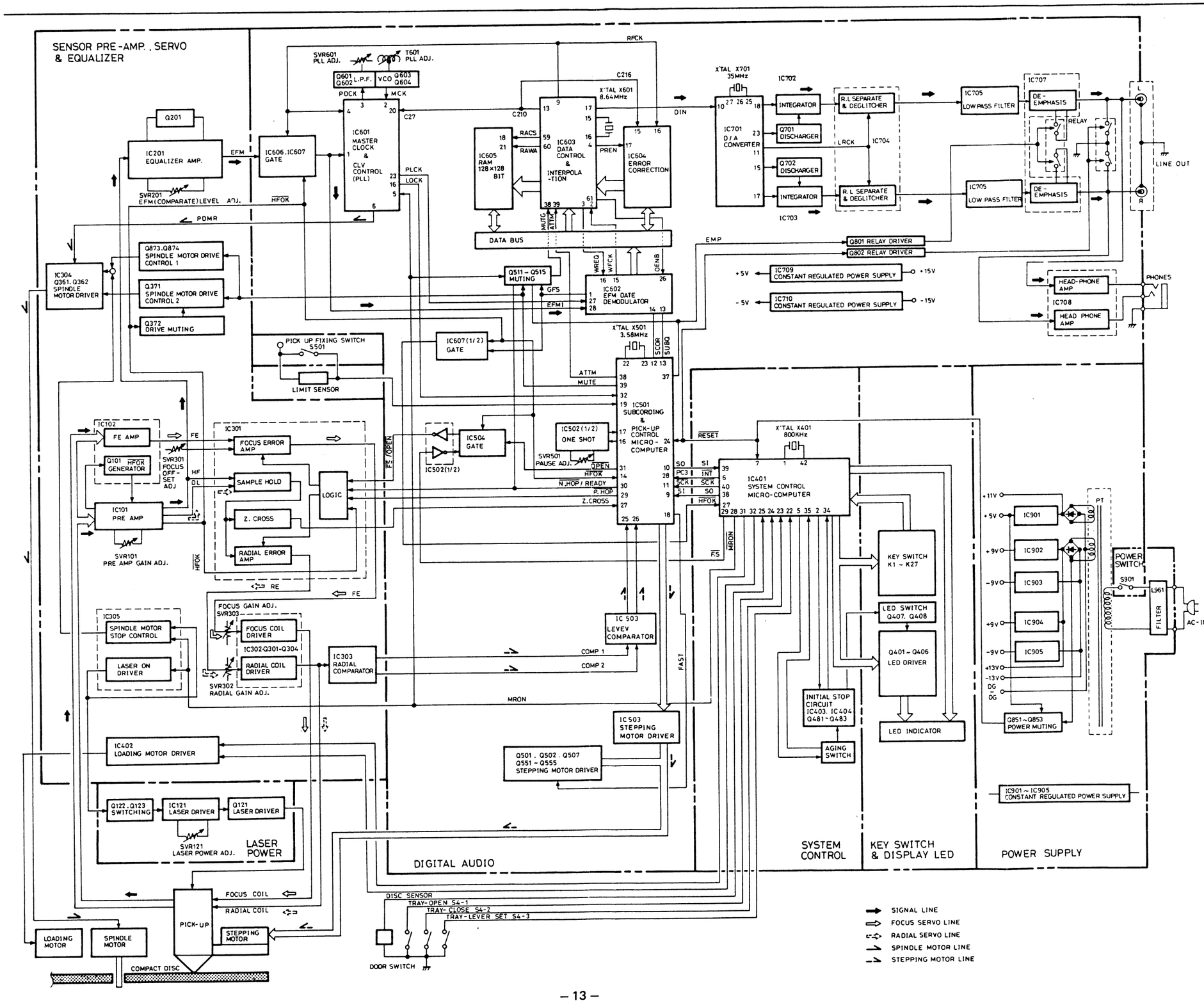
6. PRINTED CIRCUIT BOARD LAYOUT



7. PRINTED CIRCUIT BOARD CONNECTIONS

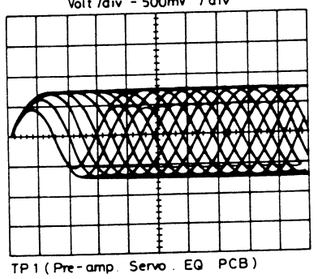


8. BLOCK DIAGRAM



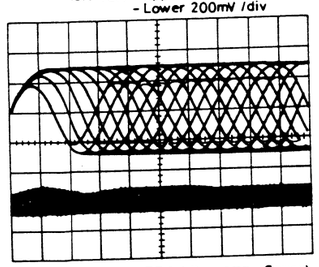
SIGNAL WAVEFORMS

① HF Signal
Time/div - 500nsec / div
Volt /div - 500mV / div



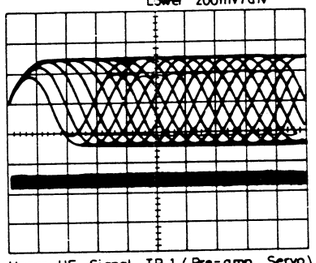
TP 1 (Pre-amp. Servo. EQ PCB)

② HF & DL Signal
Time/div - 500nsec / div
Volt /div - Upper 500mV /div
- Lower 200mV /div



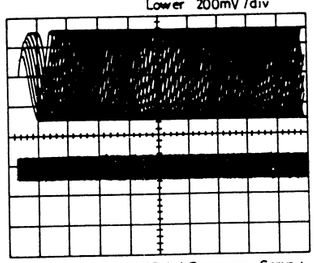
Upper HF Signal TP 1 (Pre-amp. Servo
Lower DL Signal TP 2 \ EQ. PCB)

③ HF & FE Signal
Time / div - 500nsec
Volt /div - Upeer 500mV/div
Lower 200mV/div



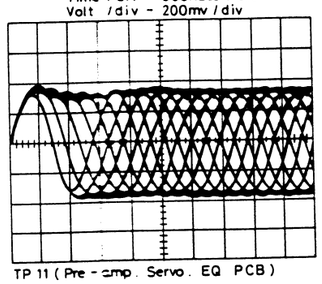
Upper HF Signal TP 1 (Pre-amp. Servo)
Lower DL Signal TP 3 \ EQ PCB)

④ HF & RE Signal
Time/div - 2µsec / div
Volt /div - Upper 500mV /div
Lower 200mV /div



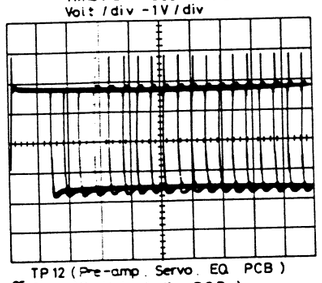
Upper HF Signal TP 1 (Pre-amp. Servo)
Lower RE Signal TP 4 \ EQ PCB

⑤ EQ Out Signal
Time / div - 500nsec / div
Volt /div - 200mv / div



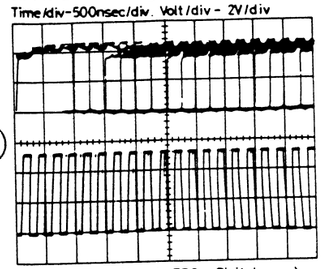
TP 11 (Pre-amp. Servo. EQ PCB)

⑥ EFM Signal
Time / div - 500nsec / div
Volt / div - 1V / div



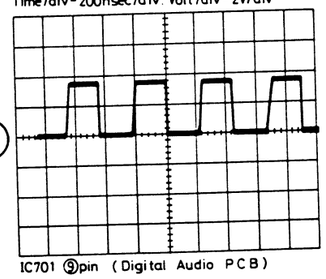
TP 12 (Pre-amp. Servo. EQ PCB)
or TP 1 (Digital Audio PCB)

⑦ EFMI & PLCK Signal
Time/div-500nsec/div. Volt/div - 2V/div



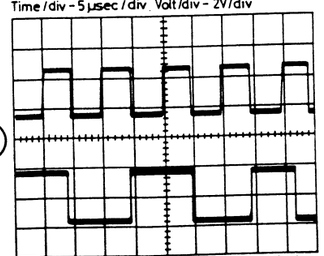
Upper EFMI Signal TP3 (Digital
Lower PLCK Signal TP4 \ Audio PCB)

⑧ BCLK Signal
Time/div-200nsec/div. Volt/div-2V/div



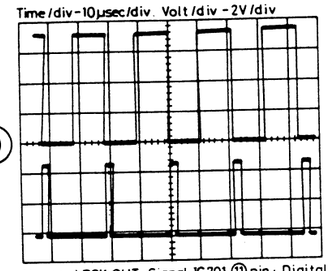
IC701 ⑨pin (Digital Audio PCB)

⑨ WCLK & LRCK Signal
Time/div-5µsec/div. Volt/div-2V/div



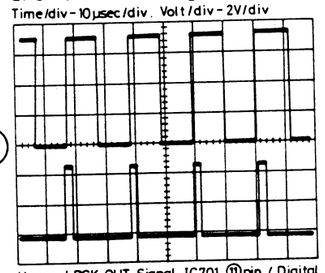
Upper WCLK Signal IC701 ⑧pin (Digital
Lower LRCK Signal IC701 ⑦pin \ Audio PCB)

⑩ LRCK OUT & DCL Signal
Time/div-10µsec/div. Volt/div - 2V/div



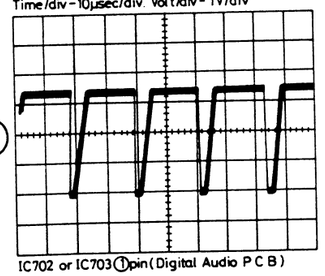
Upper LRCK OUT Signal IC701 ⑪pin (Digital
Lower DCL Signal IC701 ㉓pin \ Audio PCB)

⑪ LRCK OUT & DCR Signal
Time/div-10µsec/div. Volt/div-2V/div



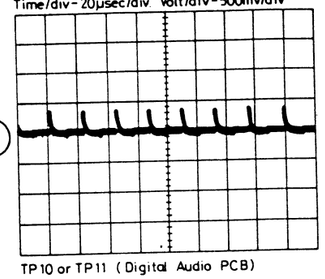
Upper LRCK OUT Signal IC701 ⑪pin (Digital
Lower DCR Signal IC701 ⑮pin \ Audio PCB)

⑫ Integrator Output Signal (Input-Zero)
Time/div-10µsec/div. Volt/div-1V/div



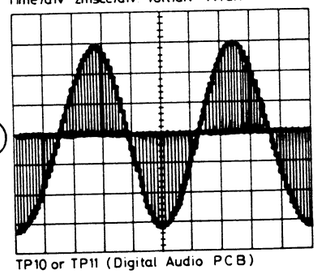
IC702 or IC703 ①pin (Digital Audio PCB)

⑬ Aperture Output Signal (Input-Zero)
Time/div-20µsec/div. Volt/div-500mv/div



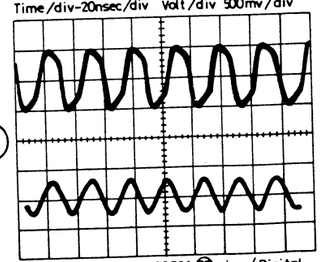
TP10 or TP11 (Digital Audio PCB)

⑭ Aper Ture Output Signal (Input-1KHz 0dB)
Time/div-2msec/div. Volt/div-1V/div



TP10 or TP11 (Digital Audio PCB)

⑮ C CUT & $\overline{\text{C IN}}$ Signal
Time/div-20nsec/div Volt/div 500mv/div



Upper C CUT Signal IC701 ㉕ pin (Digital
Lower $\overline{\text{C IN}}$ Signal IC701 ㉗ pin \ Audio Signal)

11. ALIGNMENT

Compact disc player adjustments

This manual has so far explained cautions related to operation and repair of the compact disc player, handling of the pick-up and unit disassembly. Read these previous sections before servicing the player. The following section will explain adjustments of the compact disc player in the order shown below.

Step	Adjustment item
1.	Laser power adjustment
2.	Skew adjustment
3.	Turntable height adjustment
4.	Preamplifier gain adjustment
5.	EFM (compare rate level) adjustment
6.	PLL adjustment
7.	Radial gain adjustment
8.	Focus offset adjustment
9.	Focus gain adjustment
10.	RE (radial error) voltage, tracking voltage confirmation
11.	PAUSE adjustment
12.	Checking adjustments

A. When replacing the pick-up

a. Adjustment of all steps in the above table are necessary.
b. Carefully adjust the laser power in step 1 above.
c. The skew adjustment in step 2 above is the basis for all succeeding adjustments. Be sure the skew is properly adjusted.

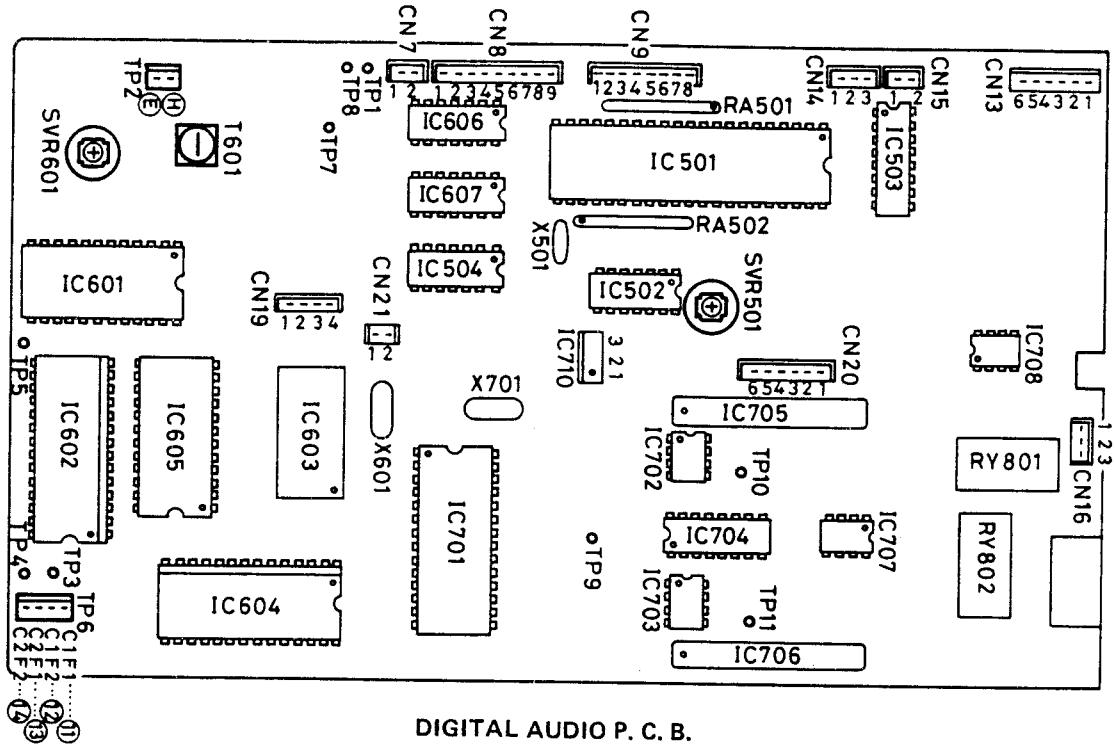
B. When the pick-up is not replaced

a. If the CD player does not function properly, readjust the items in steps 3 through 12.
b. When any item in the above table has been adjusted, all following items must also be readjusted.
(E.g., If item 6, PLL adjustment is adjusted, items 7 – 12 must also be readjusted.)
c. When the pick-up is not replaced, the skew does not usually need adjustment. However, if the eye pattern of the HF signal is not open, adjust the skew.
(Refer to the eye pattern, p.21 Fig. 8-1 (b).)

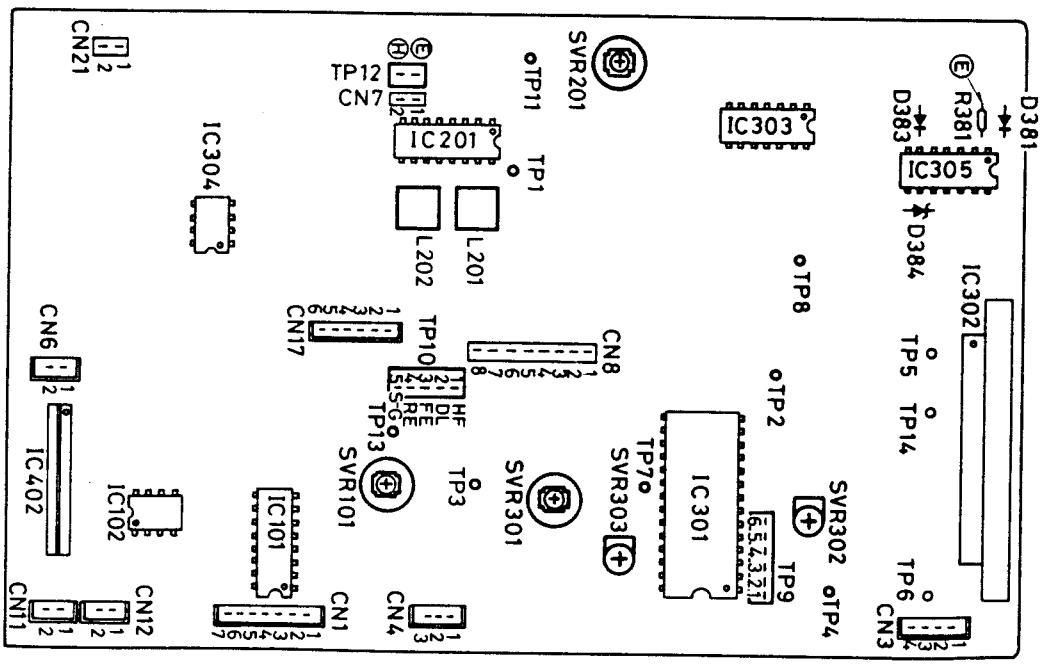
C. Others

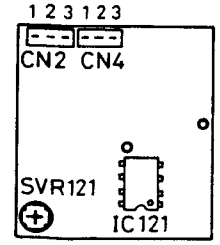
a. Although all adjustments are possible without the connector tools listed in the adjustment specifications, we recommend the described tools be made and used to facilitate adjustments.
b. Refer to p. 32 to check improper operation of the CD player.
c. When checking signals with a synchroscope, memory scope, or digital voltmeter, use a probe. Also, connect the probe ground to the specified ground line.

10. PARTS LOCATIONS



DIGITAL AUDIO P. C. B.





LASER POWER P.C.B

SENSOR PRE-AMPLIFIER. SERVO & EQUALIZER P. C. B.

Test discs for adjustments

No.	Product name	Contents (mfg.)
No. 1	800104 400088 400067	Demonstration disc (Polygram)
No. 2	YEDS 7	For signal characteristics tests (SONY)
No. 3	Eccentricity disc	Eccentricity width + 200μm
No. 4	Surface oscillation disc	Surface oscillation width + 400 ~ + 500μm
No. 5	Black line disc	Black line width + 300μm (black spot)

Note: Discs may be changed without notice due to purchasing trends.

Equipments for adjustments

Product name	Model name (mfg.)
Optical power meter	ML96A (with MA911A sensor) (Anritsu Electric)
Storage scope	DSS6521 (Kikusui Electric)
Oscilloscope	SS5711 (100MHz) (Iwasaki Communications)
AC digital voltmeter	A digital tester or digital multi-tester may be used.
DC digital voltmeter	A digital tester or digital multi-tester may be used.
AF oscillator	

Note: Equipments made by other manufacturers may also be used if the specifications and performance are the same with above equipments.

(1) Laser power adjustment

Test disc	Test equipment	Connection	Adjust	Adjustment value
– – – – –	Optical power meter	pick-up	SVR121	0.3mW

Preparation

Notes 1. Refer to the section on "HOW TO DISASSEMBLE THE UNIT" for removal of the cabinet, bottom lid, and front panel.
2. Remove the mechanism tray in the order shown in the above figure.

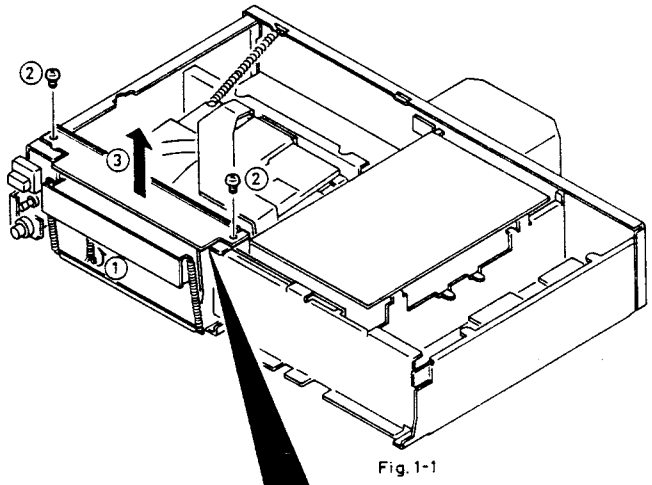


Fig. 1-1

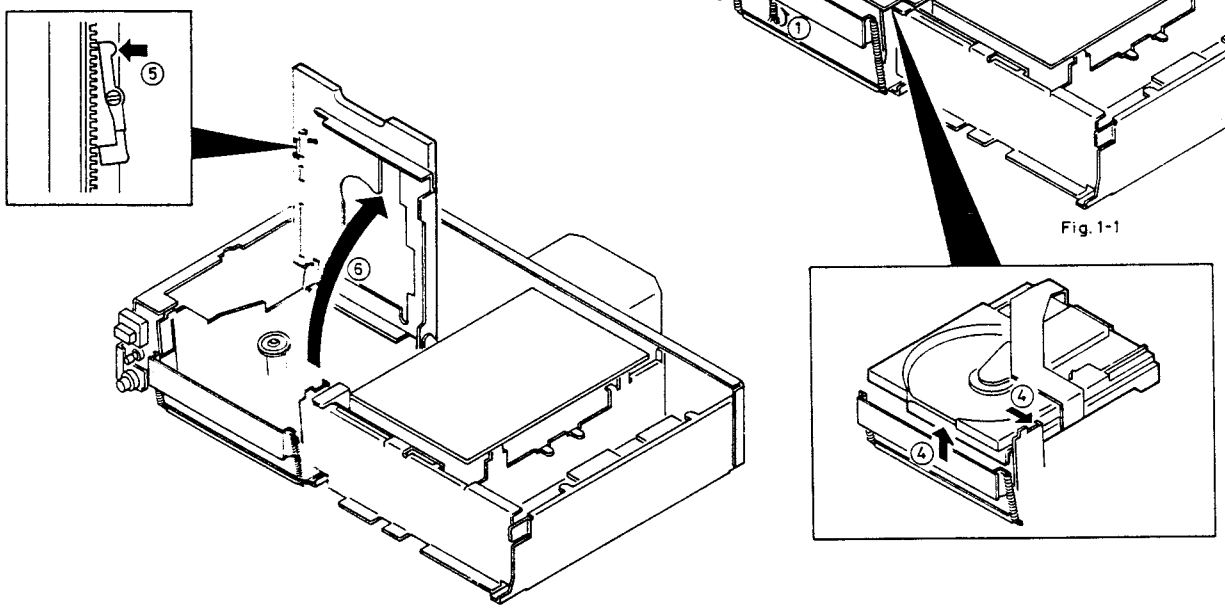


Fig. 1-2

Do not look directly at or touch the laser light given off by the pick-up.

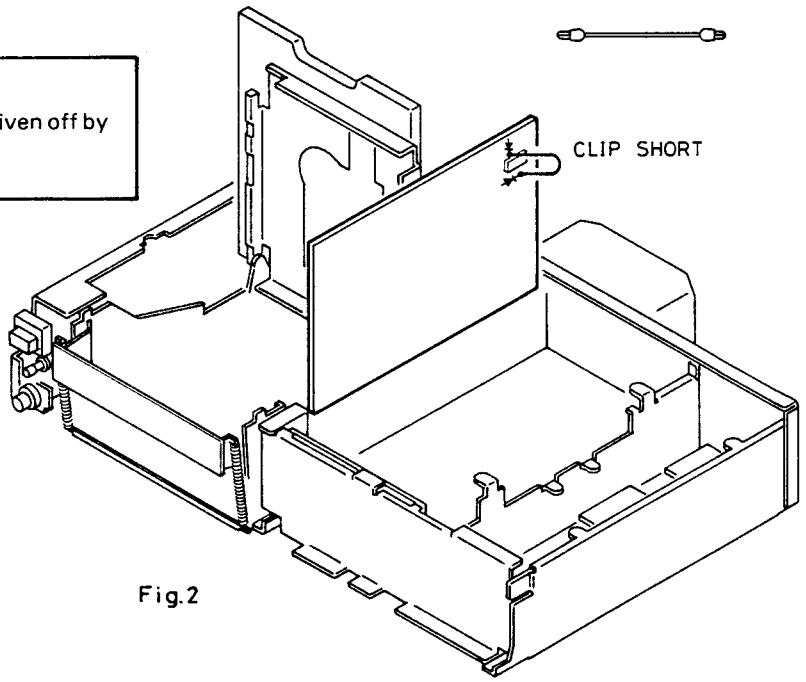
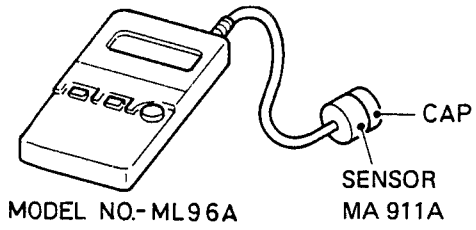


Fig.2



OPTICAL POWER METER

Fig.3

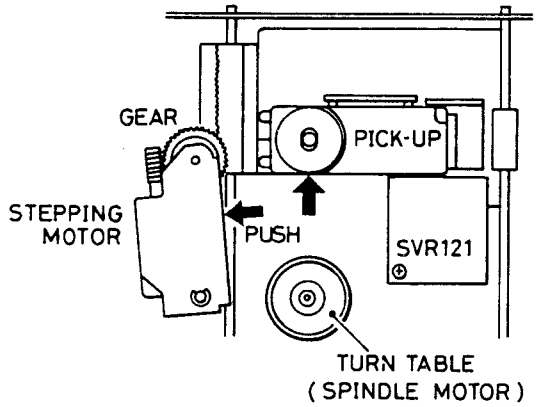


Fig.5

Adjustment

1. Adjust the zero point of the optical power meter.
2. Turn the SVR121 fully counterclockwise.
3. Press the power switch.
4. Align the sensor of the optical power meter with the pick-up laser (obiection lens).
5. Short circuit the cathodes of diodes D383 and 384.
6. Turn the SVR121 slowly counterclock wise until the optical power meter indicates a value of 0.3mW.

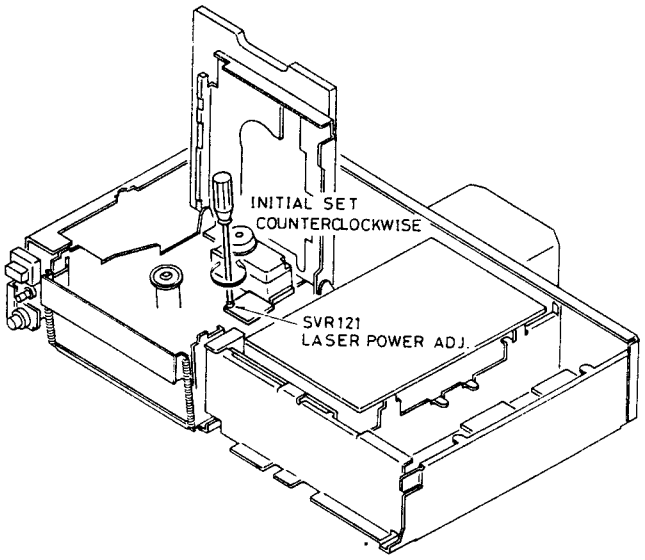


Fig.4

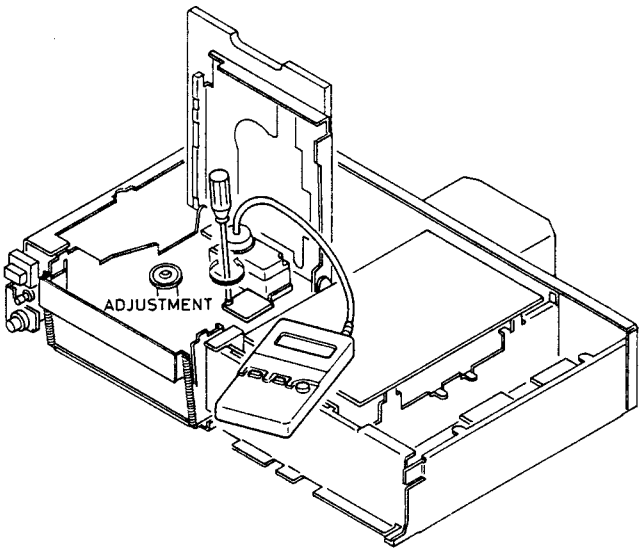


Fig.6

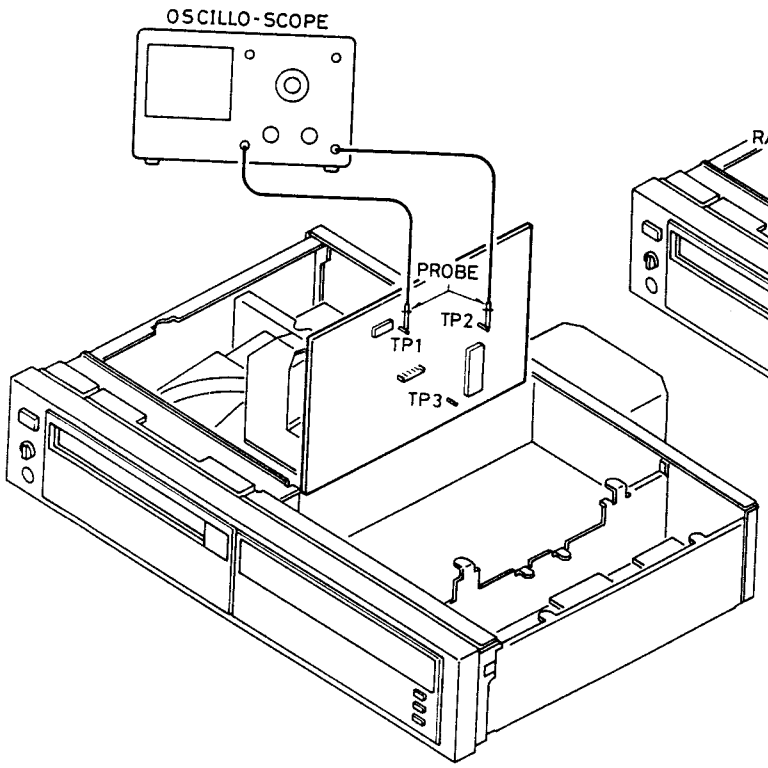
Notes 1. Instep 5, the laser ON signalis compulsorily set to HIGH.

2. Instep 1, leave the cap on the sensor and turn the zero set control until the optical power meter reads 0.000mW.
3. When performing step 3, the pick-up will move to the lead-in position. Release the stepping motor gear and move the pick-up to a point enabling easier access and measurement.
4. Never set the laser power wattage higher than 0.35mW. Turning the SVR121 clockwise or turning it excessively will result in damage and destroy the semi-conductor laser. The semiconductor laser must be replaced with a new one if geater than 0.35mW is applied to it accidentally.
5. Donot look directly at or touch the pick-up laser.
   Looking at the laser may result in eye damage, and touching the pick-up may damage the pick-up.
6. The pick-up has three different ranks: A, B, C. Check that the connection of R130 and R131 on the laser power circuit board match with the pick-up rank. (Refer to p.33.)
7. The pick-upmay be damaged or destroyed if the optical power meter sensor contacts the pick-up lens. (Use a MA911A sensor of which has a broadly processed detector hole.)
8. Before adjustment, make proper calibration of equipments because the calibration value is different depending on the combination of optical power meter and sensor to be used. (In combination of the ML96A optical power meter and MA911A sensor, are combined, 0.3mW output is obtained at a reading of 0.286mW.)

(2) **Skew adjustment**

Test disc	Test equipment	Connection	Adjust	Adjustment value
No. 1	Oscilloscope,	TP 1 (Sensor preamp, servo, equalizer PCB) TP 2	Tangential set screw, radial set screw	Refer to Fig. 8

(Oscilloscope ground: S-G)



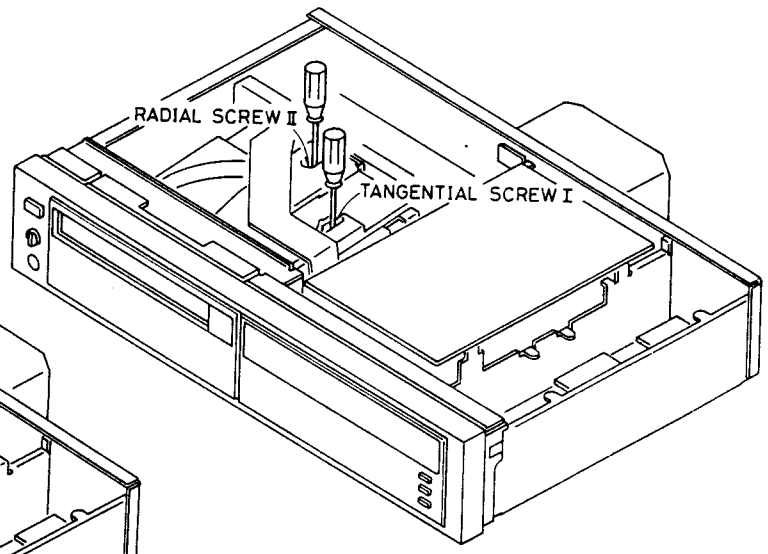


Fig. 9

Fig. 7

1. Insert a test disc No. 1.
2. Connect TP1 (HF signal) and TP2 (DL signal) to the oscilloscope.
3. Press the PLAY button.
4. Adjust SVR301 to get the same focus voltage (DC) in the play and stop modes.
5. Confirm that: (1) part "a" of the HF signal is a straight line, and (2) part "b" of the HF signal (eye pattern) is open (Note 1). (Refer to the waveform shown in Fig. 8-1.)
6. If (1) and (2) in step 5 above are not properly adjusted, adjust the angle of the pick-up table with set screw I (tangential skew). At the same time, adjust pick-up table tangential set screw II (radial skew) so that the HF signal amplitude is maximized and DL signal amplitude is minimized. (Refer to the waveforms shown in Fig. 8-2 to Fig. 8-6.)
7. Repeat the adjustment in step 6 until the waveform in Fig. 8-2 is obtained.

Notes 1. Refer to section (8), focus offset adjustment, for details concerning the adjustment in step 4 above.

2. The "open" (or broad) state of part "b" in the HF signal (eye pattern) indicates that there is little jitter. When there is a lot of jitter, the eye pattern will be blurred, and the waveform of part "b" will appear to be closed (narrow).
   Jitter: The appearance of playback signal shaking due to time delay caused by fluctuation of the medium.
3. Should adjustment by the above method not be possible, adjust skew adjustment screws I and II so that the rhombus in the DL signal comes to a point where the HF signal phase is advanced +90° from the HF signal trigger start point as shown in Fig. 8-7. (The rhombus is the jitter crossover.)

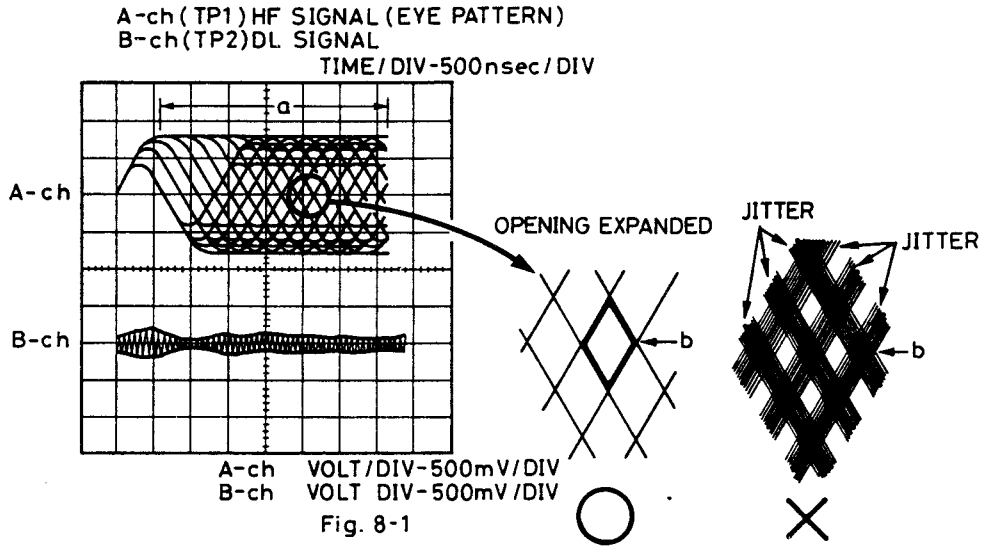


Fig. 8-1

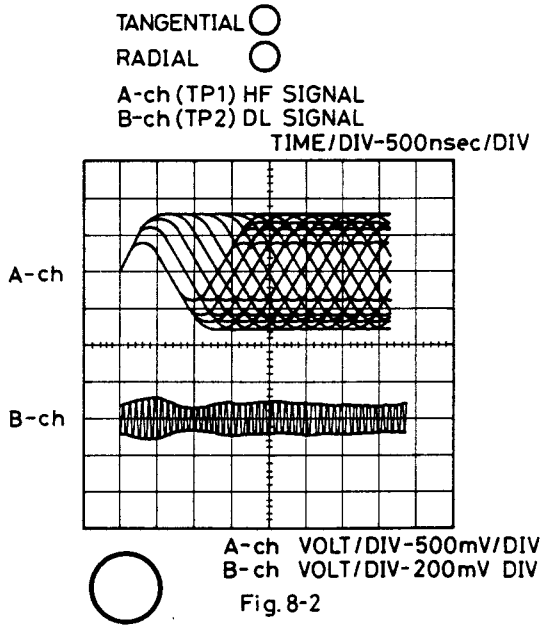


Fig. 8-2

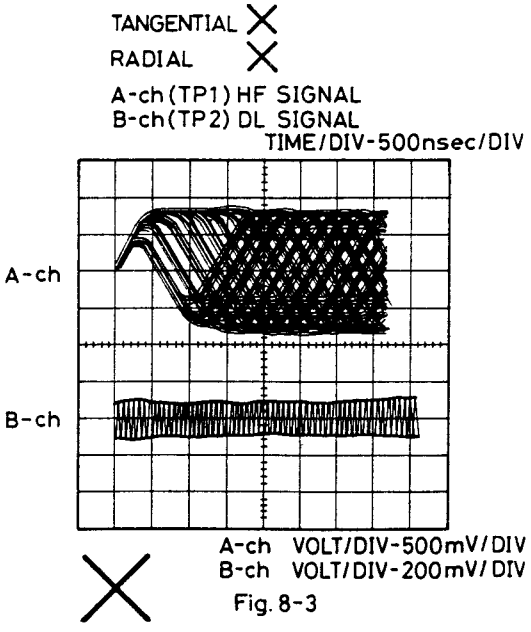


Fig. 8-3

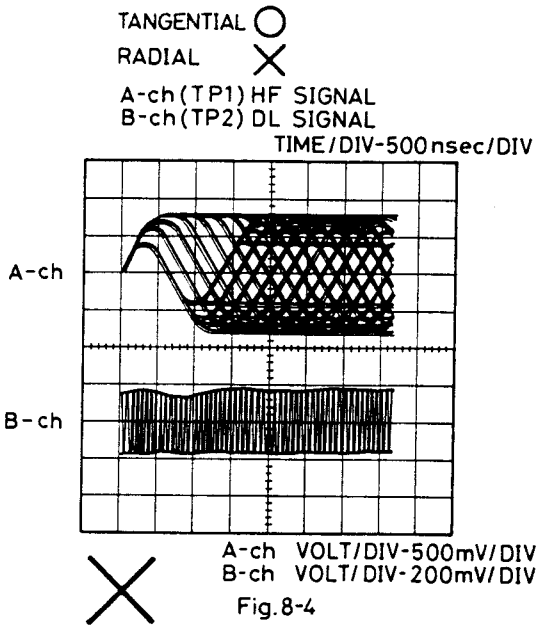


Fig. 8-4

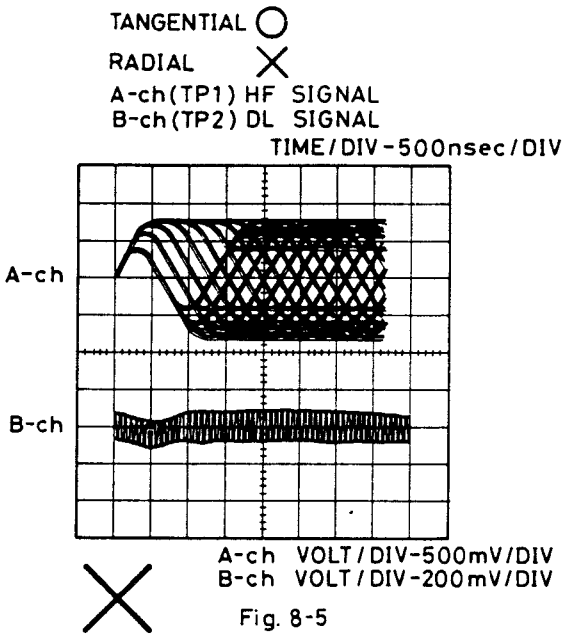


Fig. 8-5

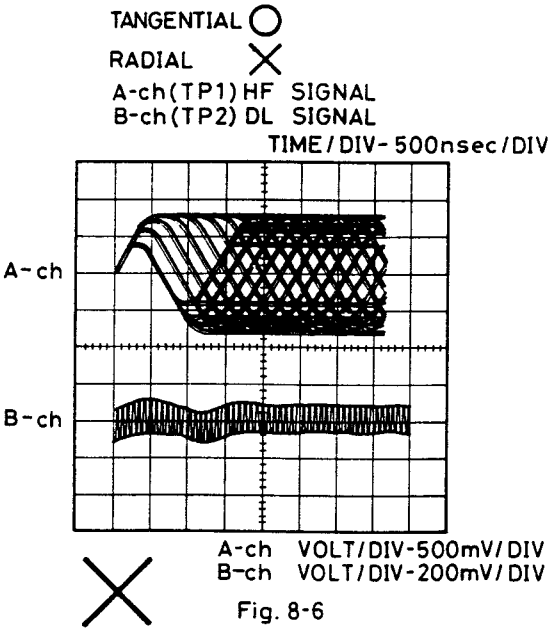


Fig. 8-6

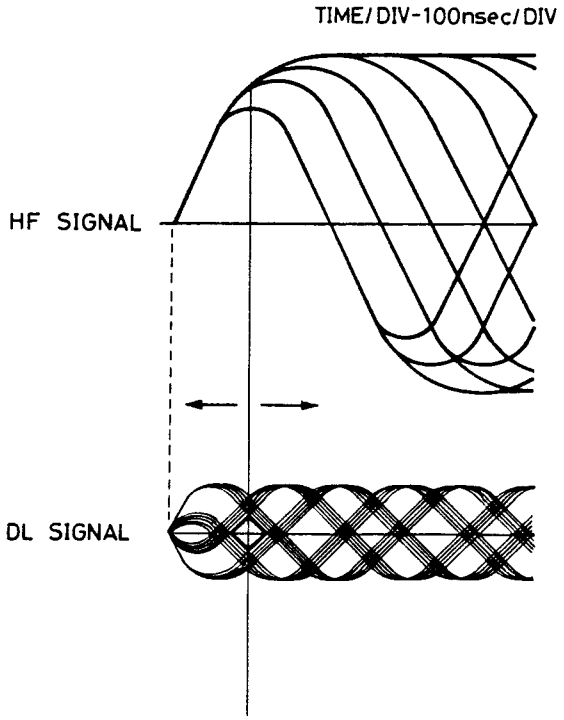


Fig. 8-7

(3) Turntable height adjustment

Test disc	Test equipment	Connection	Adjust	Adjustment value
No. 1	Oscilloscope, Storage scope	TP 1 (Sensor preamplifier, servo, equalizer PCB) TP 1	Spindle motor shaft screw	See Fig. 12

(Oscilloscope, storage scope ground: S-G)

1. Insert a test disc No. 1.
2. Turn the power off, and stand the unit vertically.
3. Disconnect connector CN3.
4. Short circuit the anode of diode D381 to the ground.
5. Connect the oscilloscope to TP1 (HF signal).
6. Connect the storage scope to TP3 (FE signal).
7. Turn the power on, and press the PLAY button.
8. While observing the HF signal waveform on the oscilloscope, observe the FE signal on the storage scope, and adjust the spindle motor shaft until wave peak " t1 " and " t2 " are of equal duration (50% duty). (Refer to the waveforms in Fig. 12.)
9. Turn the power off, and set the unit horizontally.

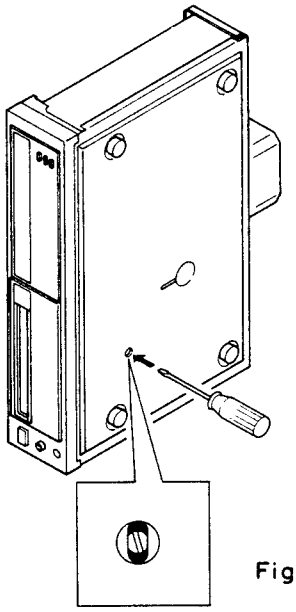


Fig.11

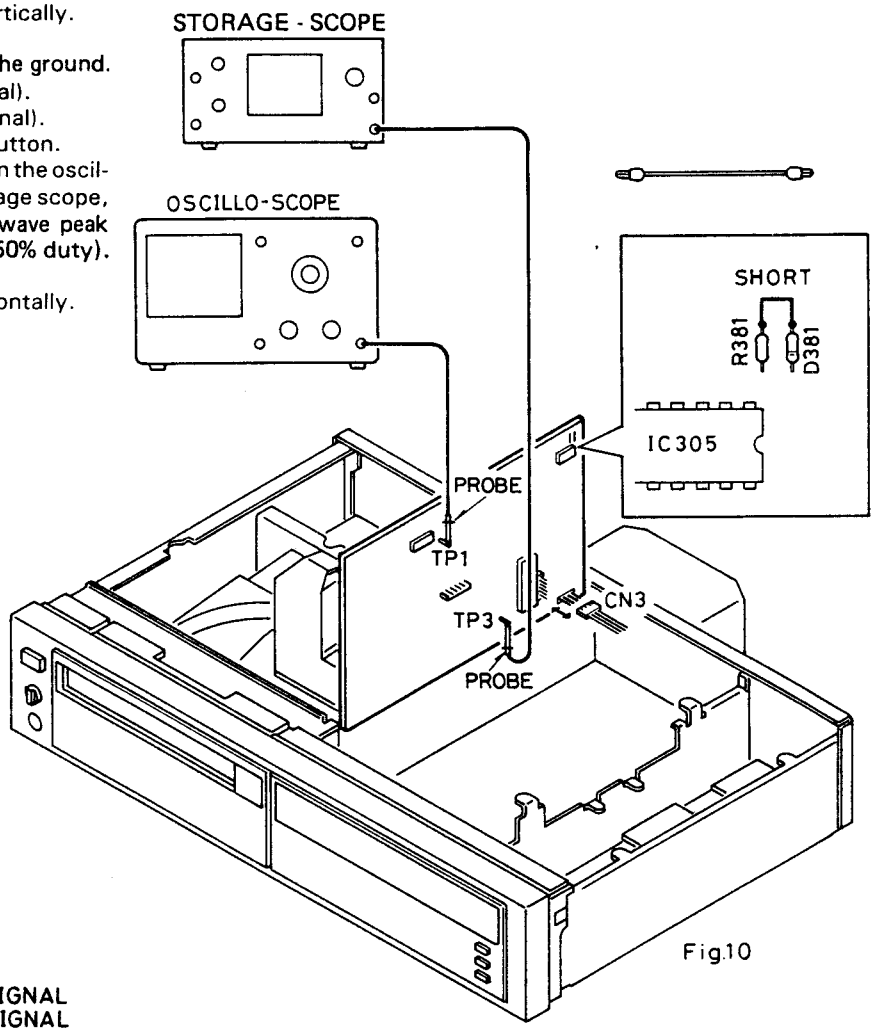


Fig.10

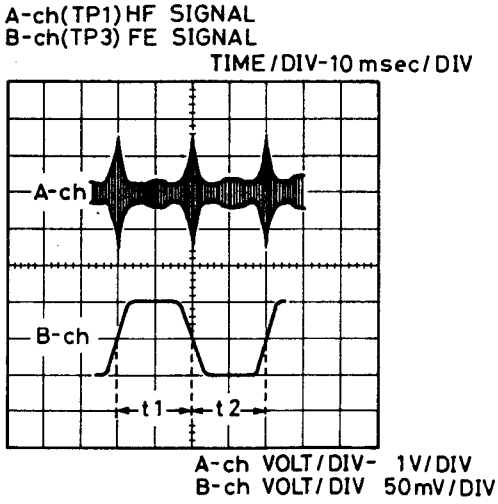


Fig. 12

Notes 1. If a storage scope is not available, an oscilloscope can be used, although adjustment will be slightly more difficult.
2. The pitch of the spindle motor adjustment screw is relatively high, thus producing nominal backlash. The screwdriver should be removed (the screw should not be pressed) when checking the adjustment.
3. Should a signal waveform not be observed, turn the adjustment screw fully clockwise or counter-clockwise, and then gradually turn it in the opposite direction to locate the position where the FE signal waveform inverts from either the HIGH or LOW condition.
4. When adjustment is completed, open the anode of D381 from the ground and reconnect the CN3 connector to its original position.

(4) Preamplifier gain adjustment

Test disc	Test equipment	Connection	Adjust	Adjustment value
No. 1	Oscilloscope	TP 1 (Sensor preamplifier, servo, equalizer PCB)	SVR 101	1.5Vp – p See Fig. 14

(Oscilloscope ground: S-G)

1. Insert a test disc No. 1
2. Connect the oscilloscope to TP1 (HF signal).
3. Press the PLAY button.
4. Adjust SVR101 so that the HF signal waveform is 1.5V peak-to-peak. (Refer to the waveform in Fig. 14.)

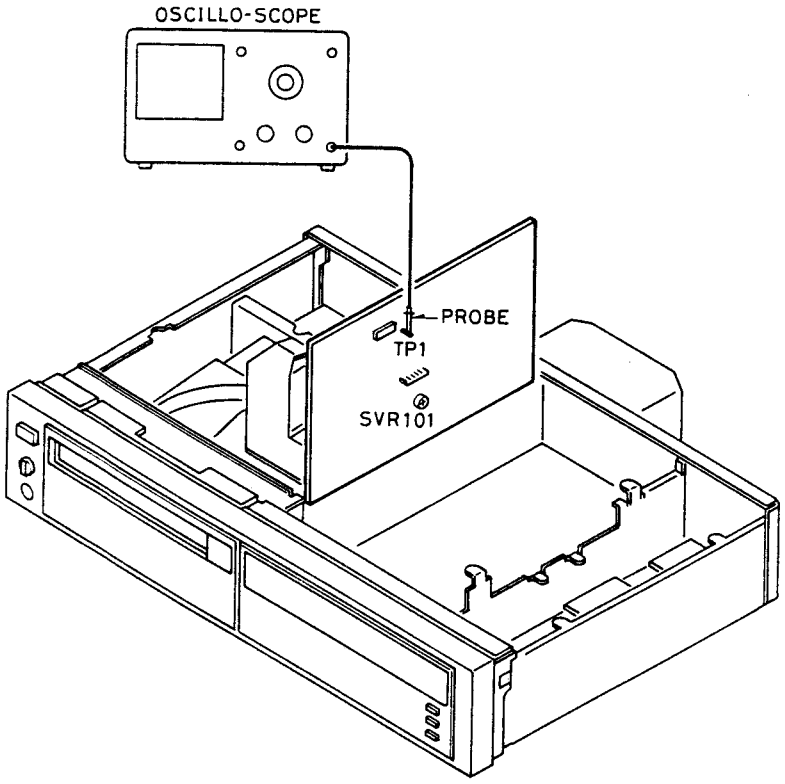


Fig.13

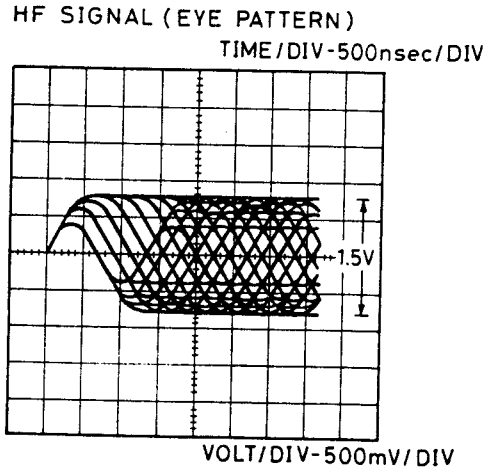


Fig. 14

(5) EFM (comparator level) adjustment

Test disc	Test equipment	Connection	Adjust	Adjustment value
No. 1	Oscilloscope	TP 1 (Sensor preamplifier, servo, equalizer PCB) TP 1 (Digital audio PCB)	SVR 201	1V See Fig. 16

(Oscilloscope ground: D-G)

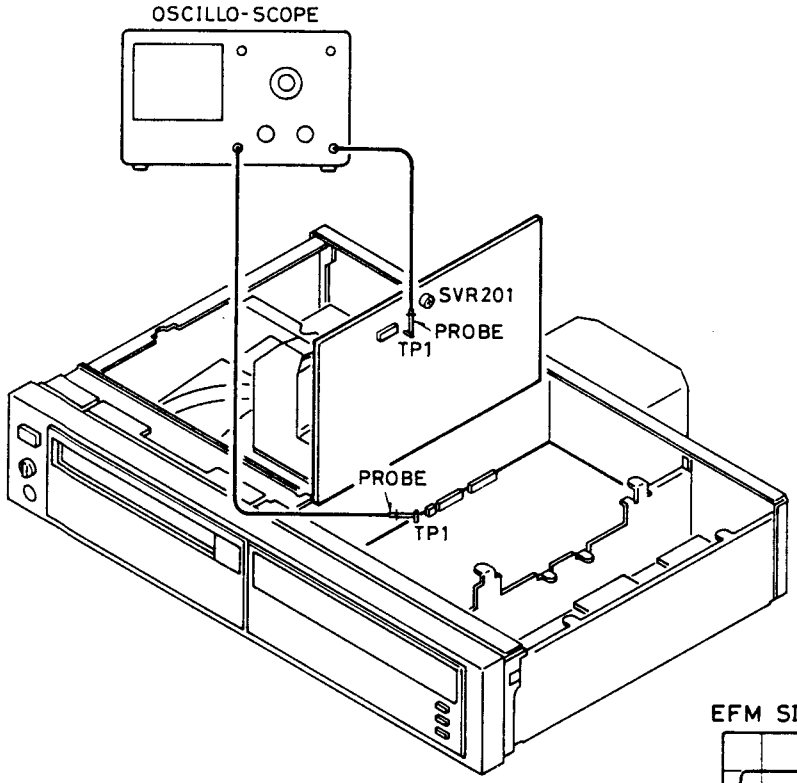


Fig.15

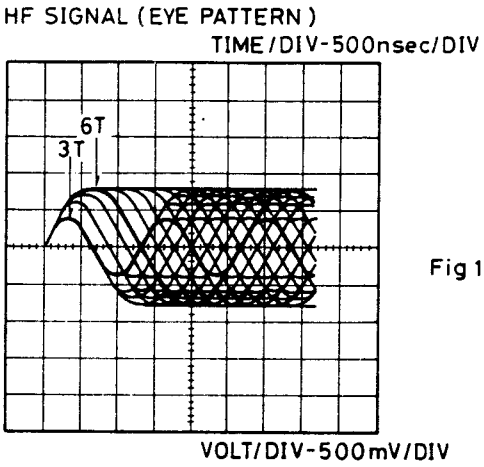


Fig 16-1

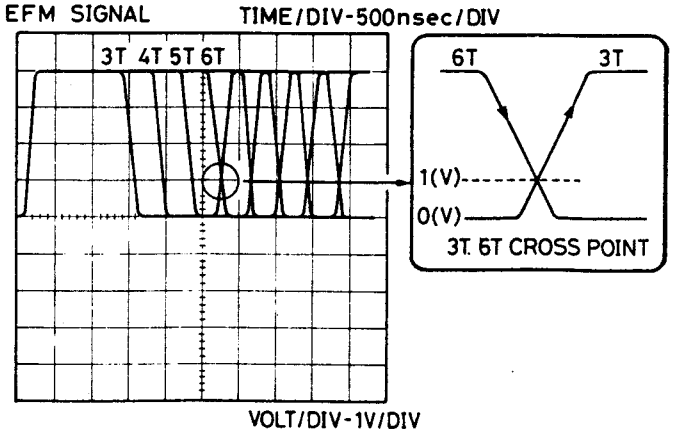


Fig. 16-2

1. Insert a test disc No. 1
2. Connect the oscilloscope to TP1 (HF signal).
3. Press the PLAY button.
4. Adjust SVR301 so that the eye pattern in the oscilloscope is stable. (Refer to the waveform in Fig. 16-1.)
5. Connect the oscilloscope to TP1 (EFM signal) in the digital audio PCB.
6. Adjust SVR201 so that the intersection of the first 6T drop and the second 3T rise waveform on the oscilloscope is at 1V. (Refer to the waveform in Fig. 16-2.)

Notes 1. Do not mistake 6T with 5T or 7T. If 6T is improperly read, the waveform will shift along the horizontal axis.
2. If adjustment is not possible with the above method, connect a frequency counter to TP6 (IC604 pin 11 = C1F1), and adjust SVR201 so that the counter value is minimum.

(6) PLL (phase locked loop) adjustment

Test disc	Test equipment	Connection	Adjust	Adjustment value
No. 1	Oscilloscope	TP2 (Digital audio PCB)	T601 SVR601	Wave form voltage: 2.0V Wave form voltage: 2.5V

(Oscilloscope ground: D-G)

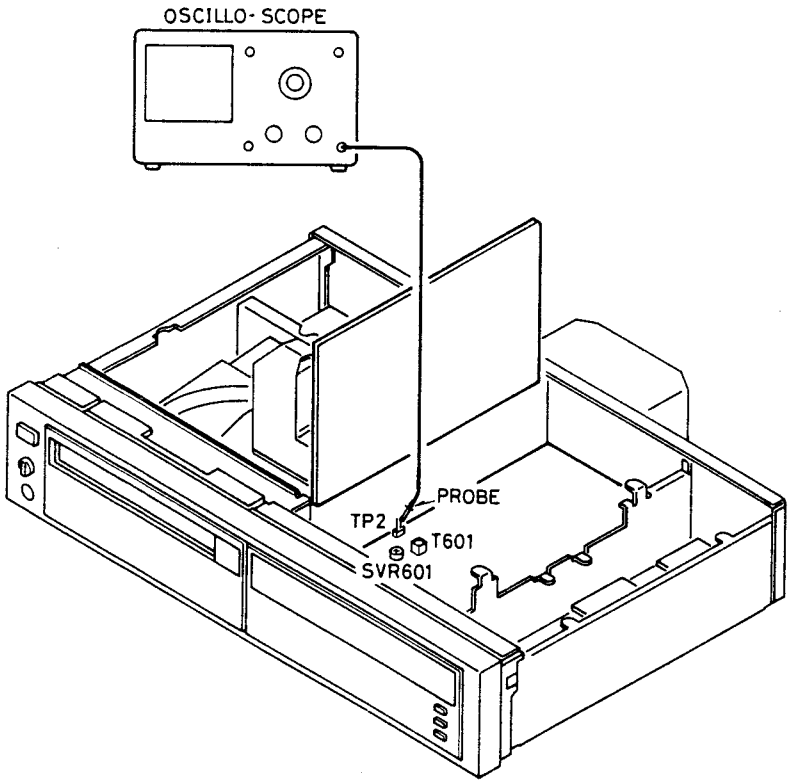


Fig.17

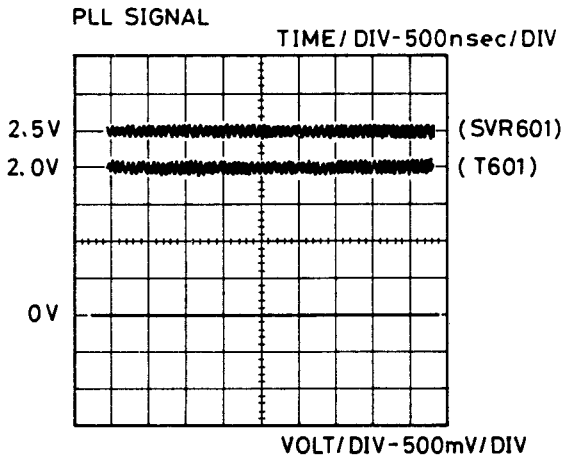


Fig. 18

1. Insert a test disc No. 1.
2. Connect the oscilloscope to TP2 on the digital audio PCB.
3. Press the PLAY button.
4. When music starts to play, adjust T601 so that the center of the waveform on the oscilloscope is at 2.0V. (Refer to the waveform in Fig. 18.)
5. Press the STOP button.
   Note: The voltage alteration will not appear even if the SVR601 is turned in the stop mode. New voltage adjusted by SVR601 appears only when a continuous play-stop operation is made.
6. Repeat the adjustment of SVR601 and a continuous play-stop operation until 2.5V is obtained.
7. Repeat steps 4 to 6, and adjust as necessary.

(7) Radial gain adjustment

Test disc	Test equipment	Connection	Adjust	Adjustment value
No. 1	AF oscillator Oscilloscope	TP 14 (Sensor preamplifier, servo, equalizer PBC) TP 4	SVR302	600mVp – p See Fig. 20

(Oscilloscope ground: S-G)

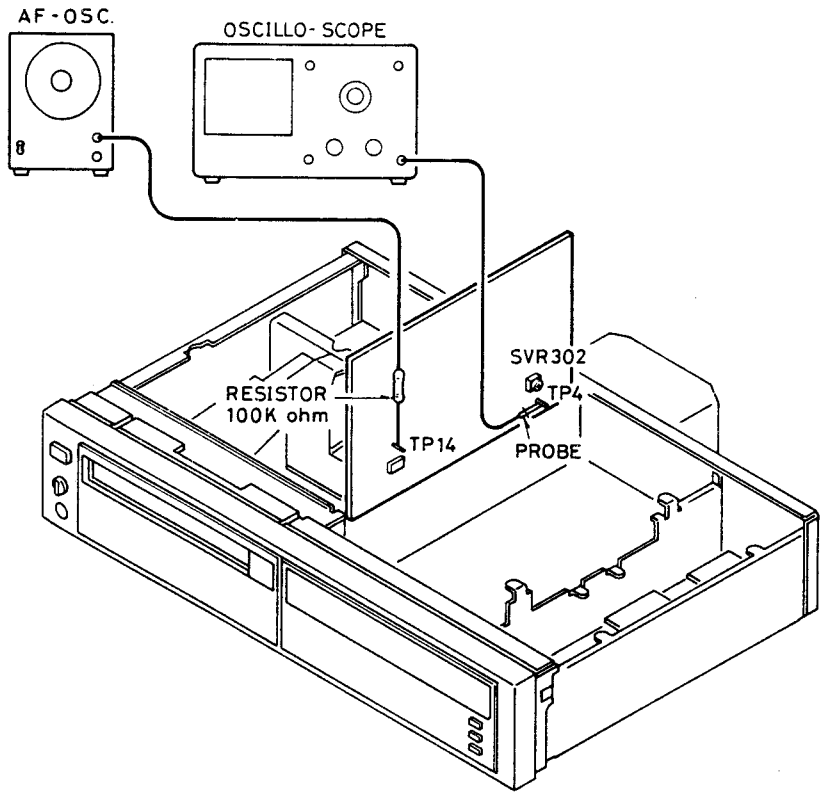


Fig.19

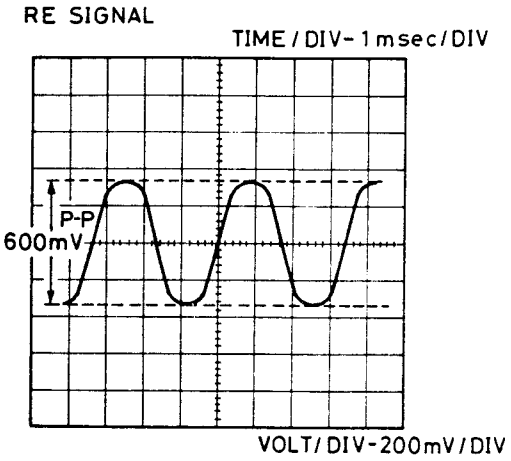


Fig. 20

1. Insert a test disc No. 1
2. Connect the AF oscillator to TP14 via a 100-k ohms resistor.
3. Connect the oscilloscope to TP4.
4. Turn the power on, and insert a test disc No. 1.
5. Press the PLAY button.
6. Adjust SVR302 so that the oscilloscope signal is 600mV peak-to-peak. (Refer to the waveform in Fig. 20.)

Note: The AF oscillator should be used with the following settings: frequency, 300Hz; output, 500mV.

P - P

(8) **Focus offest adjustment**

Test disc	Test equipment	Connection	Adjust	Adjustment value
No. 1	DC digital voltmeter	TP 3 (Sensor preamplifier, servo, equalizer PCB)	SVR301	Voltage during STOP mode : + 30 ~ 40mV

(Voltmeter ground: S-G)

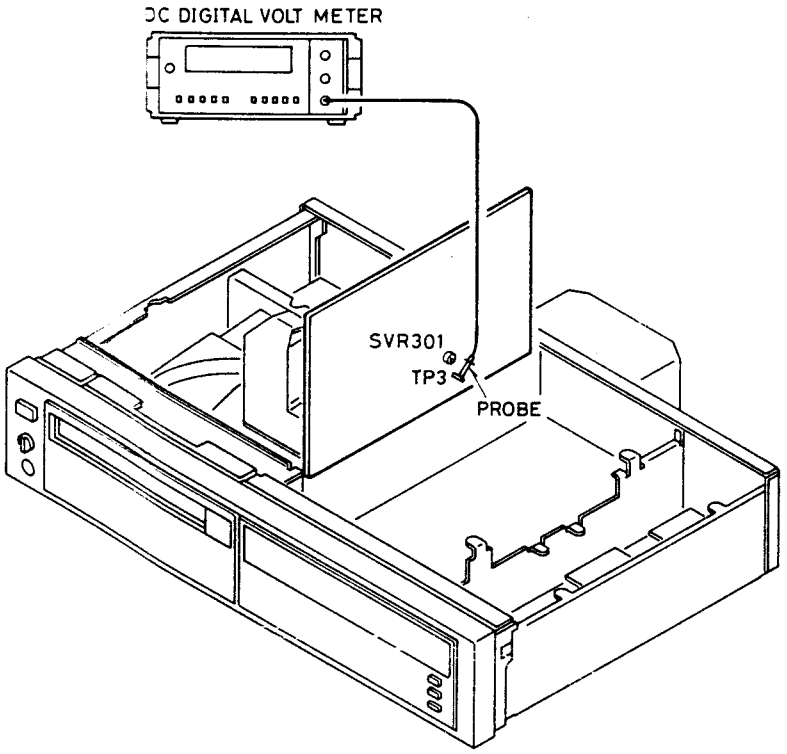


Fig. 21

1. Insert a test disc No. 1.
2. Connect the DC digital voltmeter to TP3 (FE signal).
3. Press the PLAY button.
4. Press the STOP button during PLAY mode operation. Measure and note the voltage during the stop mode.
5. Press the PLAY button and adjust SVR301 so that the voltage is 30 ~ 40mV greater than the voltage noted in step 4.

Notes 1. Use a test disc with no surface oscillation.
2. The + 30 ~ 40mV in step 5 should be adjusted as the eye pattern does not fluctuate excessively.

(9) Focus gain adjustment

Test disc	Test equipment	Connection	Adjust	Adjustment value
No. 4	Storage scope	TP 3 (Sensor preamplifier, servo, equalizer PCB)	SVR303	100mV p – p See Fig. 23

(Storage scope ground: S-G)

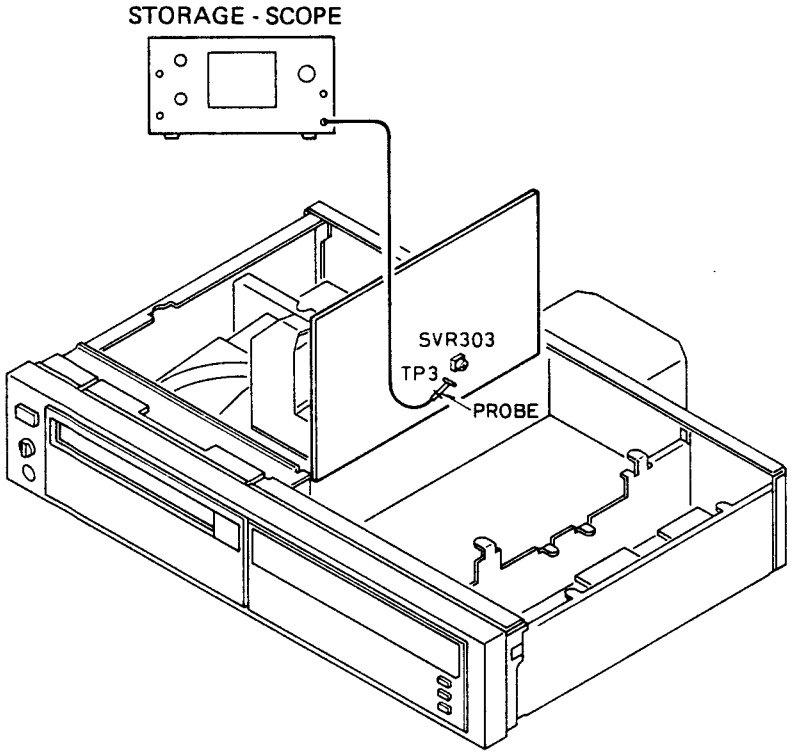


Fig. 22

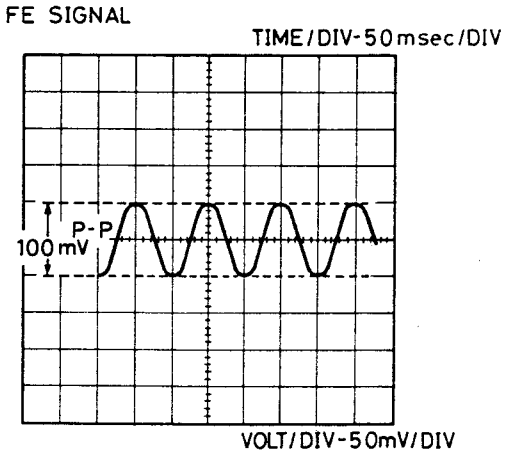


Fig. 23

1. Insert a test disc No. 4.
2. Connect a DC digital voltmeter to TP3 (FE signal).
3. Press the PLAY button.
4. Play the music in the outer most track of the disc.
5. Adjust SVR303 so that the signal is 100mV peak-to-peak. (Refer to the waveform in Fig. 23.)

Note: Test disc No. 4 for surface oscillation (surface oscillation width: +400 ~ +500μm).

(10) RE (radial error) voltage and tracking voltage confirmation

Test disc	Test equipment	Connection	Adjust	Adjustment value
No. 1	AC/DC digital voltmeter	TP 4 (Sensor preamplifier, servo, equalizer PCB)	———	AC : Greater than 300mV AC DC : Greater than 7V DC

(Voltmeter gound: S-G)

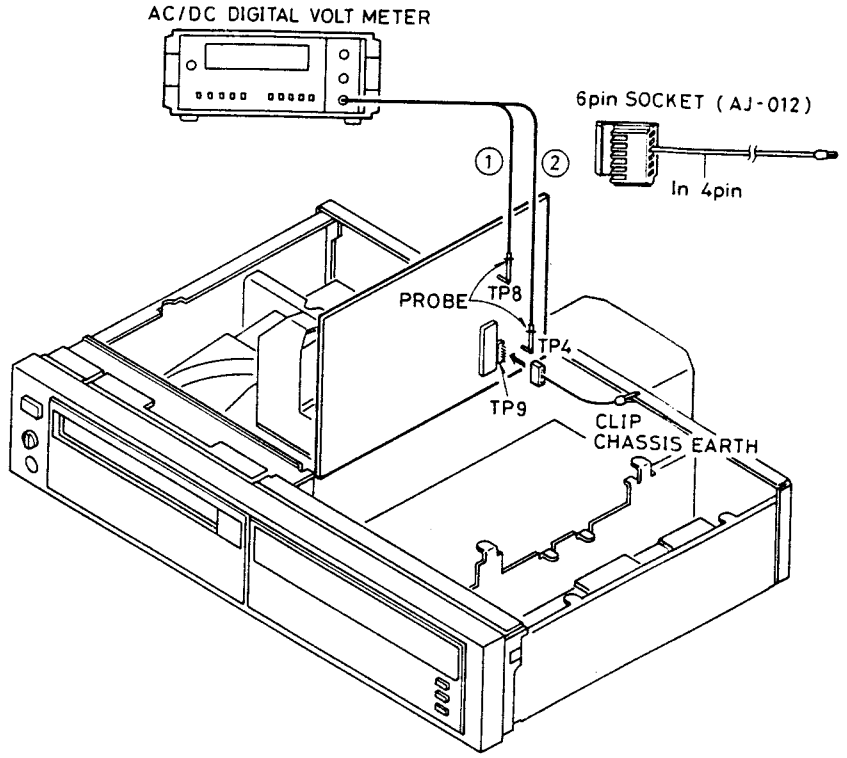


Fig.24

1. Insert a test disc No. 1.
2. Connect the AC digital voltmeter to TP4 (FE signal).
3. Mount the connector jig to TP9.
4. Short the clip of the connector jig in step 3 to the chassis (ground it to the chassis).
5. Press the PLAY button.
6. Check that the voltage on the AC voltmeter reads greater than 300mV during program playback.
7. Disconnect the connector jig.
8. Disconnect the AC digital voltmeter.
9. Connect the DC digital voltmeter to TP8.
10. Allow the stepping motor gear to run freely in the PLAY mode; the DC digital voltmeter should read greater than 7V.

Notes 1. The N HOP/READY (IC301 pin 5) signal in step 4 is compulsorily set to LOW.

2. A program should be played back during the PLAY operation in steps 6 and 10. This adjustment should not be made at the gap between programs.

*If voltages are not the required values, repeat steps 3 through 9. However, if the HF signal pattern is not distinct, repeat from step 2.

(11) **Pause adjustment**

Test disc	Test equipment	Connection	Adjust	Adjustment value
No. 1	Oscilloscope	TP 9 (Sensor preamplifier, servo, equalizer PCB)	SVR501	t = 200μsec See Fig. 26

(Oscilloscope ground: S-G)

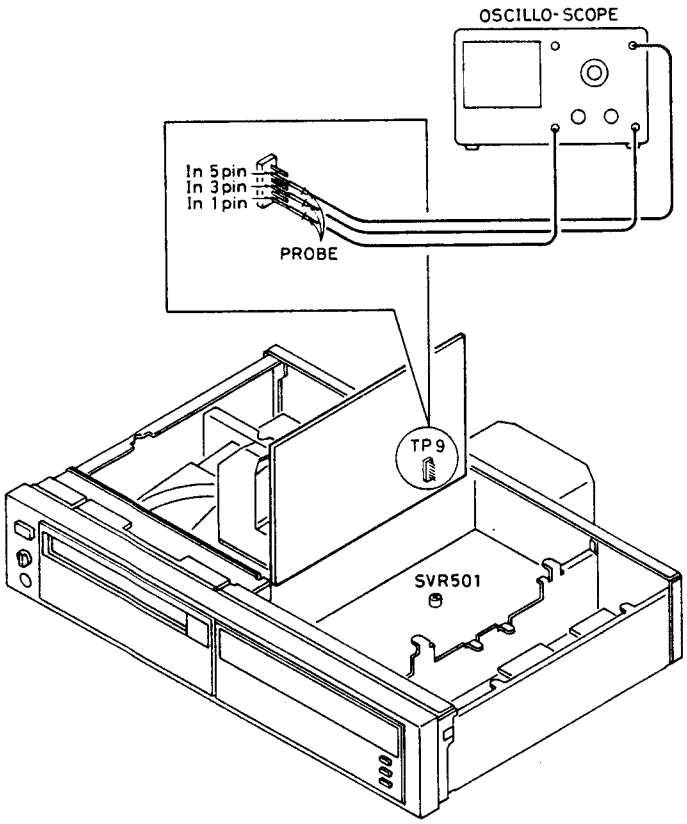


Fig. 25

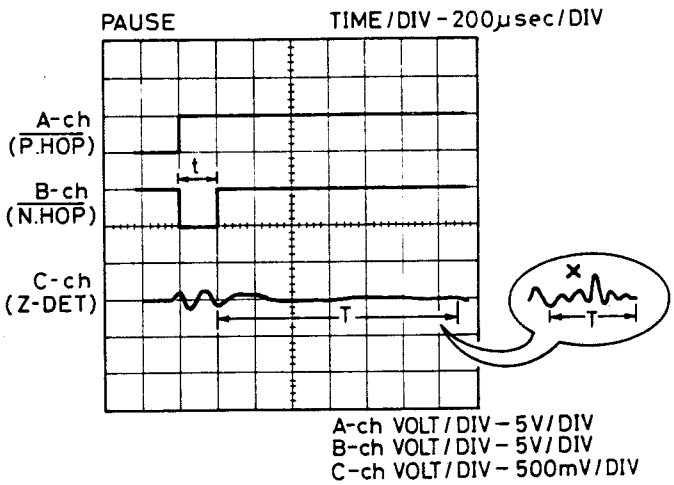


Fig. 26

1. Insert a test disc No. 1
2. Set the oscilloscope to a three-channel display, and connect it to TP9 (IC201 pin 5 (H·HOP), pin 3 (P·HOP), and pin 1 (Z-DET)).
3. Press the PAUSE button.
4. Press the FORWARD ACCESS button.
5. Adjust SVR501 so that "t" of the signal waveform on the oscilloscope (N HOP) is 200μsec while the track number indicator flashes. (Refer to the waveform in Fig. 26.)
6. Now confirm there is no track jump waveform (high mountain shaped wave) during the duration of signal waveform (Z-DET) "T" on the osciloscope. (Refer to the waveform of Fig. 26.)

Notes 1. The pause mode specified in step 3 will automatically return to the stop mode 10 minutes later. Also flashing in step 5 will automatically stop 5 seconds later and change to pause mode.
2. If the track jump waveform specified in step 6 appear, repeat the adjustments in steps 3 through 9.
3. If the oscilloscope has two-channel, input N·HOP to channel A, set the trigger, and observe Z-DET through channel B.
4. On the oscilloscope, set the input mode to CHOP, the scan mode to NORM, and the level adjustment control to (-) SLOPE. (The trigger LED must illuminate.)

(12) **Checking adjustments**

1. **EFM adjustment**
   * Intersection of first 6T drop and second 3T rise must be 1V.
   * Observe the signal waveform of TP6 (IC604 pin 11 (C1F1)) on the digital audio PCB, and adjust SVR201 to minimize the error rate (error correction signal).

2. **Focus offset adjustment**
   * The measured voltages during stop and play modes should be: PLAY mode voltage = STOP mode voltage + (30 to 40mV).

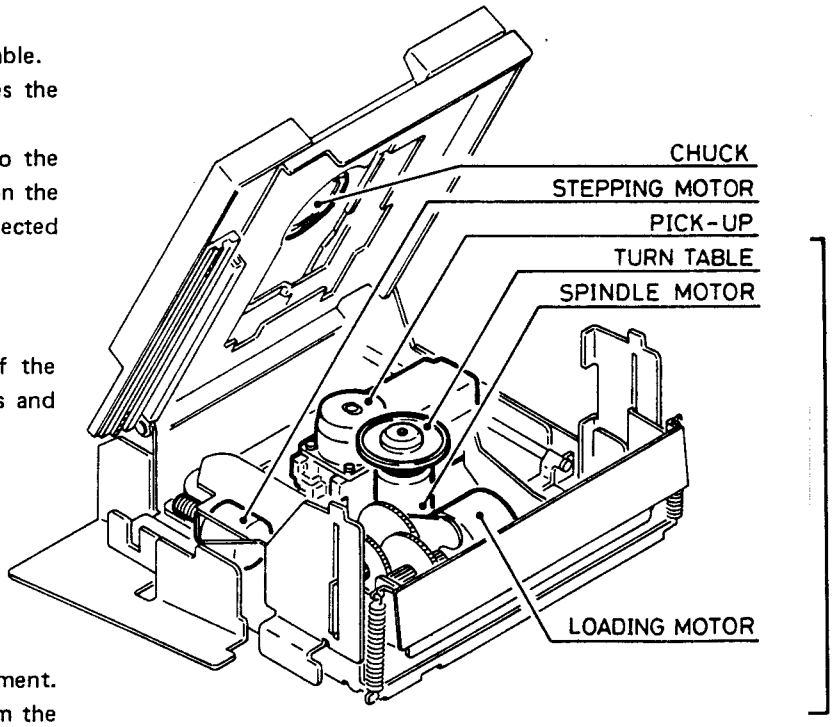
3. **PLL adjustment**
   * The measured voltages during stop and play modes should be: PLAY mode voltage = 2.0V; STOP mode voltage = 2.5V.

4. **Test disc confirmation**
   * Black spot disc is test disc No. 5 (with 300μm black spot); during PLAY mode there is no noise and track jump.
   * Surface oscillation disc is test disc 4 (surface oscillation is +400 to +500μm); there is no track jump when playing the lead in of programs 1, 4, and 12.
   * Eccentricity disc is test disc No. 3 (eccentricity width, 200μm); there is no track jump during lead in.

12. REPLACEMENT OF PICK–UP & MOTORS

Compact disc player mechanism

Chuck	Secures the disc to the turntable.
Stepping motor	Rotated by pulses, it moves the pick-up.
Pick-up	Transmits the laser beam to the disc surface; digital signals on the disc are read out by the reflected beam.
Turntable	Holds the disc.
Spindle motor	Rotates the turntable.
Loading motor	Rotated by the pressing of the OPEN/CLOSE key, it opens and closes the disc tray.



(1) **Replacement of pick-up**

The compact disc player is a precisely constructed instrument. First of all, the angle of the laser beam emitted from the pick-up must be at a 90° angle to the disc.

If an error occurs in this angle, an error in the angle of the laser beam reflected from the disc surface will also occur, so that the signal cannot be detected and none of the servos (spindle servo, focus servo and radial servo) can operate correctly.

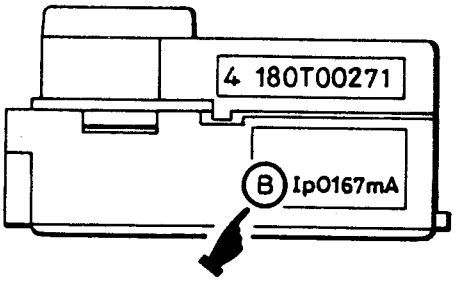
Another important factor is that the spindle motor, which rotates the disc, must rotate smoothly and without eccentricity.

As can be seen then, replacement of the pick-up or spindle motor and other parts must be done with great care in order to maintain the original precision, and it is absolutely necessary that adjustments be correctly made after the replacement.

a. Preparations

(a.) Prepare the measuring instruments and test discs which will be necessary to make adjustments.
(Before attempting to make any adjustments carefully read the section "Compact Disc Player Adjustments" on page 16)

(b.) After the adjustments are completed, be sure to apply a coating of adhesive or screw-lock paint to places where such was previously applied.



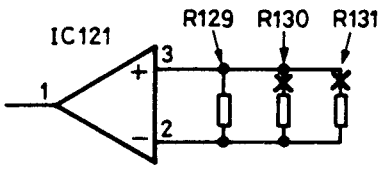
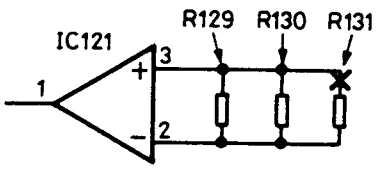
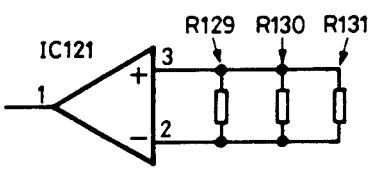
Pick-up rank indication

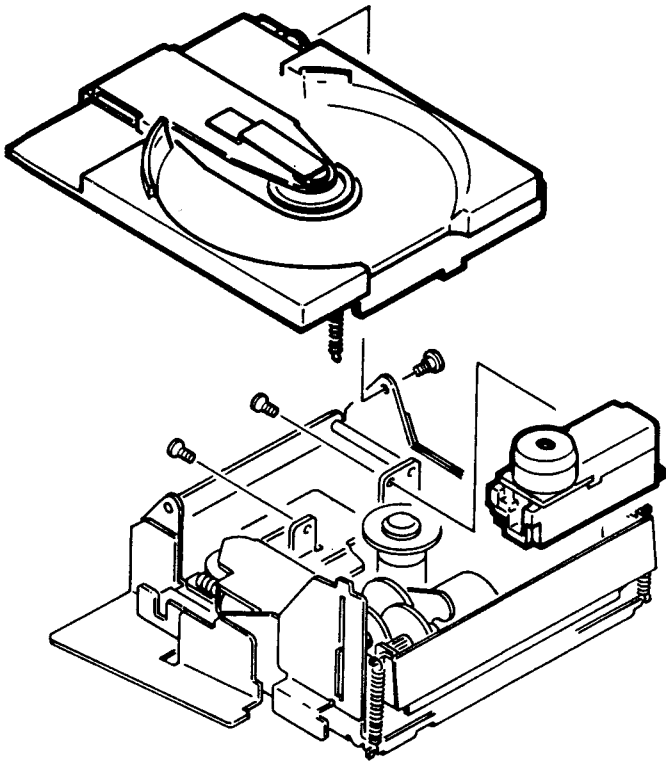
b. Pick-up replacement

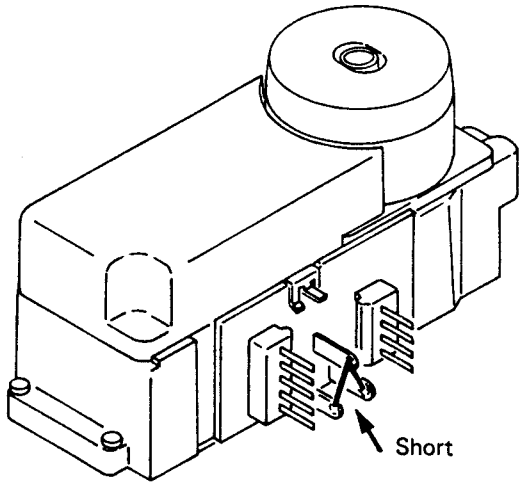
There are three ranks of pick-up: A, B and C.

Be sure to replace the pick-up with one of the same rank. If the pick-up is for any reason replaced by one of another rank, the follwing procedure will be necessary.

Change the resistance of the laser power board in accordance with the pick-up rank, as indicated below.

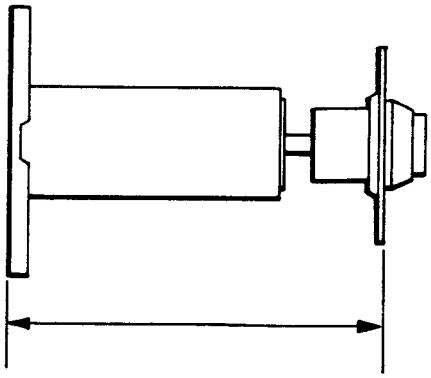
A RANK	B RANK	C RANK
		
Cut the legs of the R130 and R131 resistors.	Connect the legs of the R130 resistor. Cut the legs of the R131 resistor.	Connect the legs of the R130 and R131 resistors.





Short the terminals on the laser diode. When replacing the pick-up, first short circuit the laser diode terminals by using a lead wire, and then solder. If there is no malfunction of the pick-up, damage caused by static electricity can be prevented.

(2) Replacement of Stepping Motor & Spindle Motor

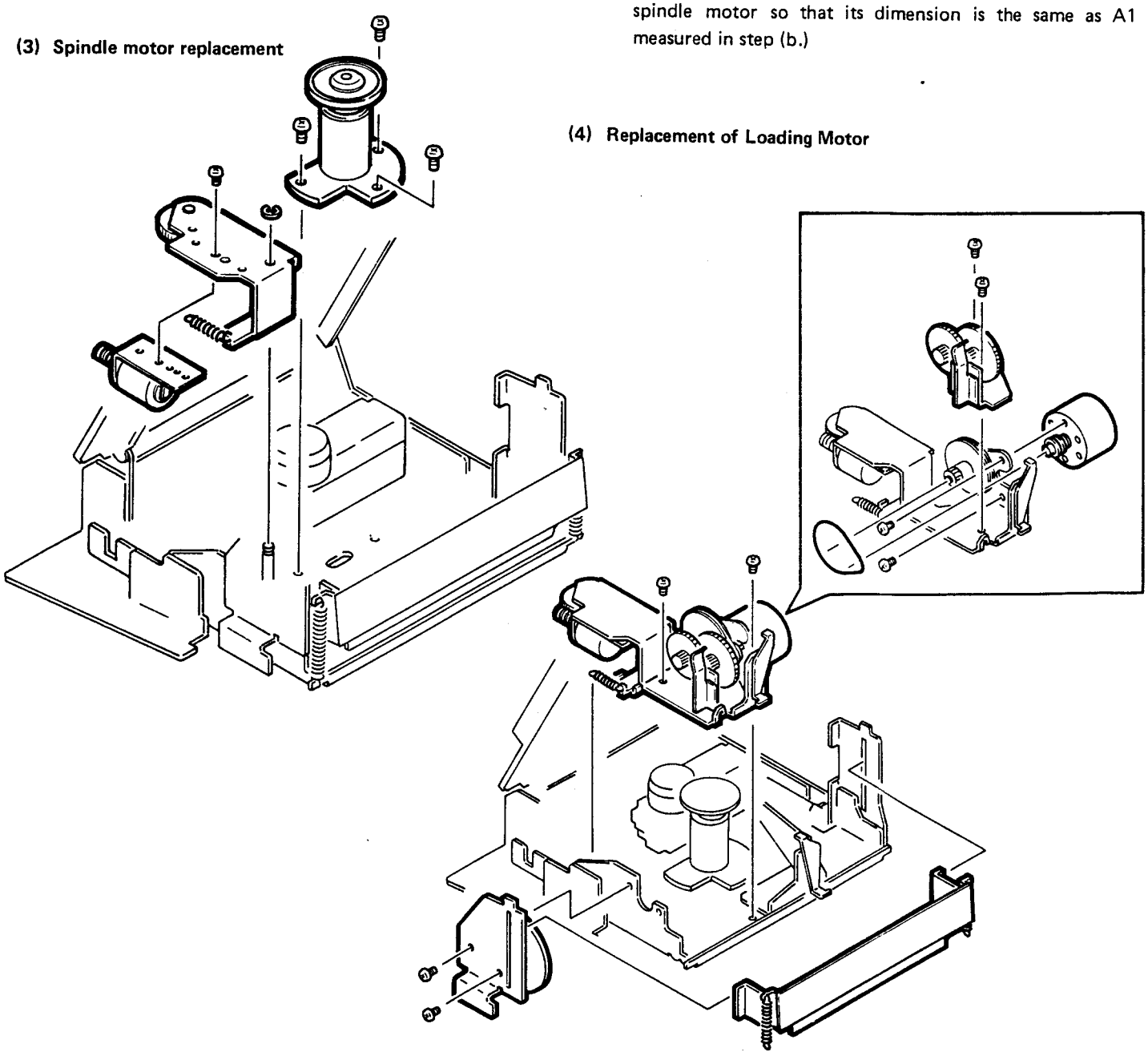


Referenc Value (46.4 ± 0.5 mm)

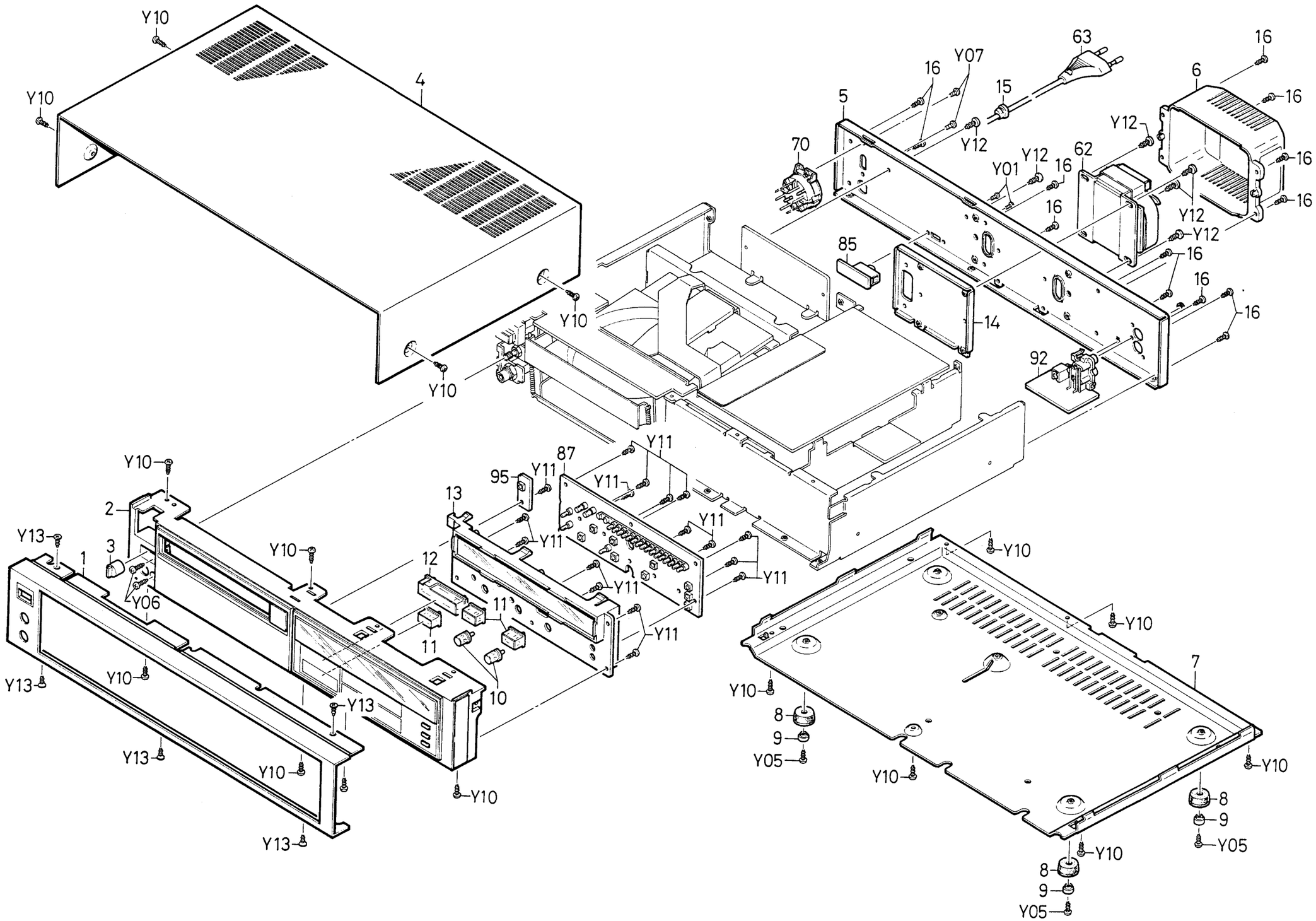
a. Remove the spindle motor from the mechanism.
b. Measure and make a note of the dimension indicated as A in the figure. (This will be A1.)
c. Completely turn the height adjustment screw at the rear of spindle motor clockwise.
   Then measure and make a note of the dimension indicated as A in the figure under this condition. (This will be A2.)
d. Remove the old spindle motor from the turntable.
e. Completely turn the height adjustment screw at the rear of the new spindle motor clockwise.
f. Attach the new spindle motor to the turntable.
   Then make an adjustment so that dimension A is the same as A2 measured in step (c.)
g. Turn the height adjustment screw at the rear of the new spindle motor so that its dimension is the same as A1 measured in step (b.)

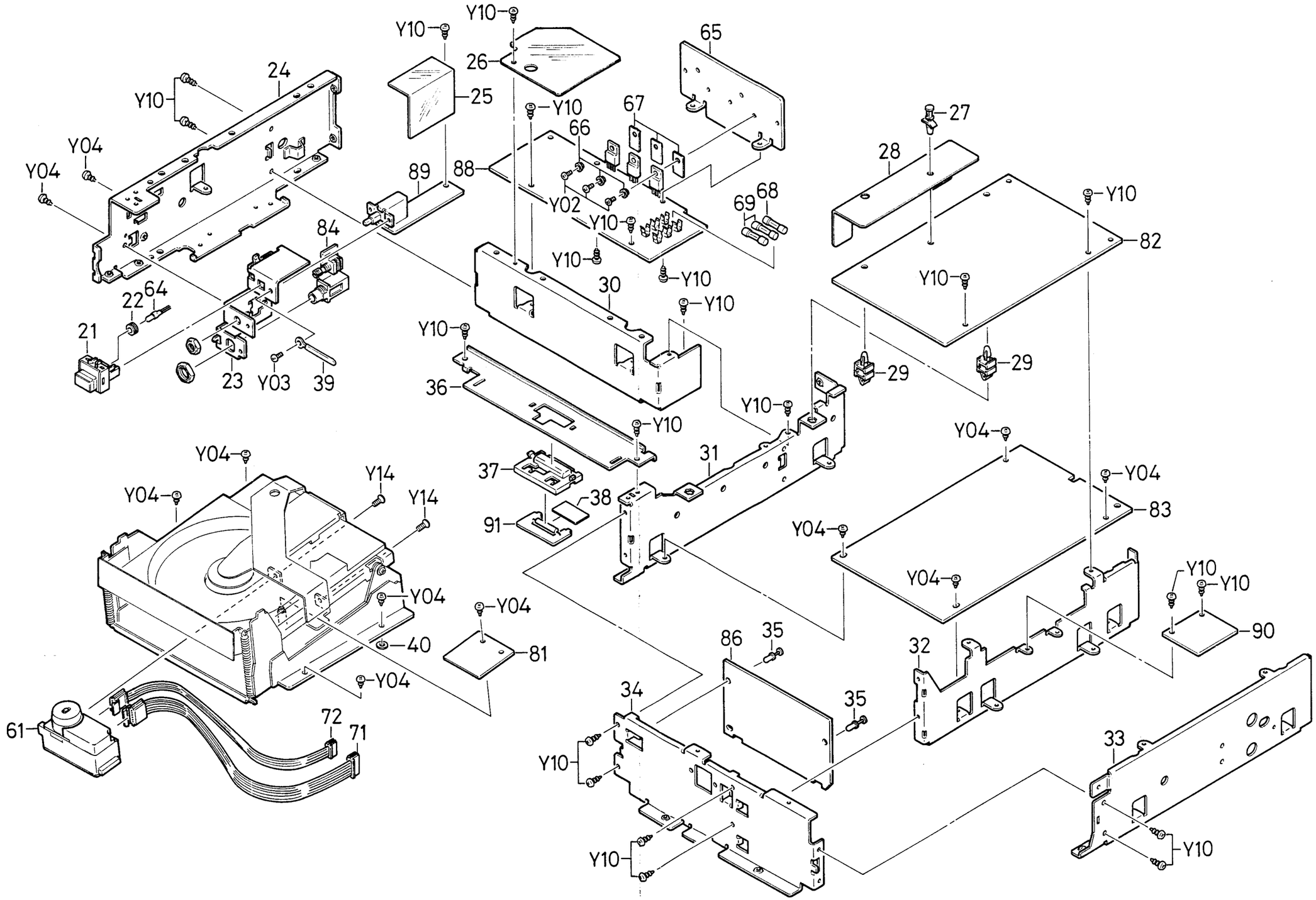
(3) Spindle motor replacement

(4) Replacement of Loading Motor



13. EXPLODED VIEWS (CABINET & CHASSIS)




Y10
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Y10
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Y10
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29
Y04
Y04
83
Y04
Y04
Y10
Y10
90

14. PARTS LIST(CABINET & CHASSIS)

Ref. No.	Part No.	Description	Q'ty
PACKING			
	141-6-133T-55800	Individual Carton (CP300)	1
	141-6-133T-55801	Individual Carton (CP300X)	1
	141-6-144T-96900	Pad, Left Side	1
	141-6-144T-96800	Pad, Right Side	1
	141-6-409T-05900	Instruction Manual	1
	141-6-235T-60551	Inner Polyethylene Lamina Bag, Set	1
	141-2-421T-47400	Special Screw, Shipping Screw, Pick-up Base	1
	4-243T-13373	Lead Cord, OUTPUT	1
CABINET & CHASSIS			
1	141-0-122T-52000	Front Panel Ass'y	1
2	141-0-221T-11001	Bracket Panel Ass'y, Front Panel (CP300)	1
	141-0-221T-11002	Bracket Panel Ass'y, Front Panel (CP300X)	1
3	141-2-163T-99100	Rotary Knob, PHONES LEVEL	1
4	141-0-111T-60800	Cabinet Ass'y, (CP300)	1
	141-0-111T-60801	Cabinet Ass'y, (CP300X)	1
5	141-2-126T-47601	Back Lid (CP300)	1
	141-2-126T-47602	Back Lid (CP300X)	1
6	141-0-135T-91705	Cover, Power Transformer	1
7	141-0-125T-33200	Bottom Lid Ass'y	1
8	141-2-174T-13600	Stand, Bottom Lid mtg.	3
9	141-2-462T-77800	Boss, Bottom Lid mtg.	3
10	141-2-253T-37500	Joint, PAUSE/REPEAT	2
11	141-2-253T-37100	Joint, STOP/ACCESS (FWD/BACK)	3
12	141-2-253T-37400	Joint, PLAY	1
13	141-0-214T-08200	Bracket Flame Ass'y	1
14	141-2-315T-29600	Reinforcement, Power Transformer mtg.	1
15	141-2-464T-14400	Fixer, Power Cord mtg.	1
16	141-2-421T-43901	Special Screw, Back Lid mtg.	13
21	141-0-160T-35200	Push Button Ass'y, POWER	1
22	141-2-445T-08701	Rubber Cushion, Pilot Lamp	1
23	141-2-310T-98800	Bracket, Power Switch	1
24	141-2-315T-29001	Reinforcement, Left Side	1
25	141-2-135T-92700	Cover, Power Switch P.C.Board	1
26	141-2-135T-93600	Cover, Power Supply P.C.Board	1
27	141-2-464T-44200	Fixer, Cover mtg.	1
28	141-2-135T-93300	Cover, Sensor Pre-amp., Servo & Equalizer P.C.Board mtg.	1
29	141-2-210T-17200	Bracket, P.C.Board mtg.	2
30	141-2-315T-30200	Reinforcement, Back Side	1
31	141-2-315T-29100	Reinforcement, Middle Side (Left)	1
32	141-2-315T-30000	Reinforcement, Middle Side (Right)	1
33	141-2-315T-29200	Reinforcement, Right Side	1
34	141-2-315T-30100	Reinforcement, Front Side	1
35	141-2-464T-40500	Fixer, System Control P.C.Board mtg.	2
36	141-2-315T-30300	Reinforcement, Mechanism Upper	1
37	141-2-135T-91800	Cover, Pilot Lamp, Compact Disc	1
38	141-2-247T-28200	Sheet, Pilot Lamp	1
39	141-2-472T-12600	Lug, Lead mtg.	1
40	141-2-453T-00801	Fiber Washer, 3 x 8 x 0.5mm	1
FIXING PARTS			
Y01		Pan Hd. Screw, 2.6 x 4mm	2
Y02		Pan Hd. Screw, 3 x 5mm	3
Y03		Pan Hd. Screw, 3 x 8mm	1
Y04		Pan Hd. Tapping Screw, 3 x 6mm	11
Y05		Pan Hd. Tapping Screw, 3 x 8mm	3
Y06		Pan Hd. Tapping Screw, 3 x 10mm	2
Y07		Binding Hd. Screw, 3 x 6mm	2
Y08		Binding Hd. Tapping Screw, 3 x 4mm	1

Ref. No.	Part No.	Description	Q'ty
FIXING PARTS			
Y09		Binding Hd. Tapping Screw, 3 x 6mm	1
Y10		Binding Hd. Tapping Screw, 3 x 8mm	35
Y11		Binding Hd. Tapping Screw, 3 x 10mm	17
Y12		Binding Hd. Tapping Screw, 4 x 8mm	6
Y13		Flat Hd. Tapping Screw, 3 x 8mm	5
Y14		Flat Hd. Screw, 3 x 8mm	2
ELECTRICAL PARTS			
61	4-180T-00271	⚠ Pick-up, Optical	1
62(T901)	4-300T-77500	⚠ Power Transformer, AC 110/220V	1
63	4-243T-84973	⚠ Power Cord	1
64(PL1)	4-612T-16371	Pilot Lamp, 14V 60mA	1
65	141-2-368T-28700	Heat Sink	1
66	141-2-243T-09800	Base, IC901, IC902 & IC903 mtg.	3
67	141-2-327T-26100	Insulator, IC901, IC902 & IC903 mtg.	3
68(FU901)	4-234T-10590	⚠ Fuse, 3.15A	1
69(FU902), (FU903)	4-234T-10587	⚠ Fuse, 1.6A	2
70(S2)	4-238T-19173	⚠ Switch, Voltage Selector, 110/220V	1
71(CNS1)	4-240T-61100	Socket, 7p, Pick-up	1
72(CNS3)	4-240T-61200	Socket, 4p, Pick-up	1
LASER POWER P. C. B. ASS'Y			
81	141-4-280T-18880	P.C.B. Ass'y, Laser Power	1
IC121		Integrated Circuit. LA6358	1
Q121		Transistor, 2SD612E	1
Q122		Transistor, 2SB598F	1
Q123		Transistor, 2SA608F	1
D121		Diode, GMA01	1
D122		Zener Diode, MTZ5.6C	1
D123		Diode, GMA01	1
D124		Zener Diode, MTZ12B	1
L121	4-253T-15024	Filter, 22µH	1
CNS2	4-240T-61300	Socket, 3p, Pick-up	1
CNS4	4-240T-61400	Socket, 3p, Sensor Pre-amp., Servo & Equalizer P.C.Board	1
	141-2-382T-21300	Terminal	2
SVR121	4-220T-04982	Semi-fixed Resistor, 10K ohm LASER POWER Adj.	1
	RESISTORS		
	All Resistors are Carbon type ±5%, 1/6W unless otherwise noted.		
R121		Flame Proof, 22 ohm ½W	1
R122		12K ohm	1
R123		4.7K ohm	1
R124		470K ohm	1
R125		3.9K ohm	1
R126		47K ohm	1
R127		1K ohm	1
R128		1K ohm	1
R129		47K ohm	1
R130		18K ohm	1
R131		8.2K ohm	1
R132		1K ohm	1
R133		27K ohm	1
R134		4.7K ohm	1
	CAPACITORS		
C121		Tantal, 10µF ±20% 10V	1
C122		Mylar 0.01µF ±10% 50V	1
C123		Mylar 0.01µF ±10% 50V	1

Ref. No.	Part No.	Description	Q'ty
LASER POWER P. C. B. ASS'Y			
	CAPACITORS		
C124		Ceramic 0.01μF +80–20% 50V	1
C125		Electrolytic 47μF 16V	1
C126		Electrolytic 47μF 16V	1
SENSOR PRE–AMP., SERVO & EQUALIZER P. C. B. ASS'Y			
82	141-4-280T-18980	P.C.B. Ass'y, Sensor Pre-Amp., Servo & Equalizer	1
IC101		Integrated Circuit, LA9000N	1
IC102		Integrated Circuit, NJM4558DD	1
IC201		Integrated Circuit, LA9010	1
IC301		Integrated Circuit, LA9100	1
IC302		Integrated Circuit, STK6922	1
IC303		Integrated Circuit, LA6324	1
IC304		Integrated Circuit, LA6458D	1
IC305		Integrated Circuit, LC4011B	1
IC402		Integrated Circuit, BA6109	1
Q101		Transistor, 2SC536H	1
Q201		Transistor, 2SC930E	1
Q301		Transistor, 2SC2362G	1
Q302		Transistor, 2SA1016G	1
Q303		Transistor, 2SD438E	1
Q304		Transistor, 2SB560E	1
Q361		Transistor, 2SD600E	1
Q362		Transistor, 2SB631E	1
Q371		Transistor, 2SC536AUD G	1
Q372		Transistor, 2SC536AUD G	1
Q373		Transistor, 2SC536AUD G	1
Q374		Transistor, 2SC536AUD G	1
D341		Diode, GMA01	1
D342		Diode, GMA01	1
D361		Diode, GMA01	1
D362		Diode, GMA01	1
D381		Diode, GMA01	1
D382		Diode, GMA01	1
D383		Diode, GMA01	1
D384		Zener Diode, MTZ5.1B	1
D451		Zener Diode, MTZ6.2A	1
L201	4-284T-00600	Delay Line	1
L202	4-284T-00600	Delay Line	1
L361	4-252T-13200	Choke Coil, 100μH	1
	123-2-471R-10400	Bead Core, Q201 mtg.	1
	141-2-368T-28200	Heat Sink	1
	141-2-310T-95100	Bracket	1
	141-2-382T-21300	Terminal	11
CNP1	4-236T-24477	Plug, 7p, Pick-up	1
CNP3	4-236T-24474	Plug, 4p, Pick-up	1
CNP4	4-236T-24473	Plug, 3p, Laser Power P.C.Board	1
CNP6	4-236T-24472	Plug, 2p, System Control P.C.Boad	1
CNP7	4-236T-24472	Plug, 2p, Digital Audio P.C.Board	1
CNP8	4-236T-24479	Plug, 9p, Digital Audio P.C.Board	1
CNP11	4-236T-24472	Plug, 2p, Loading Motor	1
NCP12	4-236T-24472	Plug, 2p, Spindle Motor	1
CNP17	4-236T-24476	Plug, 6p, Power Supply P.C.Board	1
CNP21	4-236T-24472	Plug, 2p, Digital Audio P.C.Board	1
TP9	4-236T-10273	Plug, 6p	1
TP10	4-236T-10272	Plug, 5p	1
TP12	4-236T-10293	Plug, 2p	1
SVR101	4-222T-62081	Semi-fixed Resistor, 4.7K ohm Pre-amp. Gain Adj.	1
SVR201	4-222T-62083	Semi-fixed Resistor, 10K ohm EFM (Comparator Level) Adj.	1
SVR301	4-222T-62083	Semi-fixed Resistor, 10K ohm EFM & Focus Offset Adj.	1
SVR302	4-220T-15185	Semi-fixed Resistor, 33K ohm Radial Gain Adj.	1
SVR303	4-220T-15182	Semi-fixed Resistor, 10K ohm Focus Gain Adj.	1
	RESISTORS		
	All Resistors are Carbon type, ±5% 1/6W, unless otherwise noted.		
R101		1.2K ohm	1
R102		3.3K ohm	1
R103		3.3K ohm	1

Ref. No.	Part No.	Description	Q'ty
SENSOR PRE–AMP., SERVO & EQUALIZER P. C. B. ASS'Y			
	RESISTORS		
R104		3.3K ohm	1
R105		3.3K ohm	1
R106		100K ohm	1
R107		100K ohm	1
R108		4.7K ohm	1
R109		22K ohm	1
R114		4.7K ohm	1
R201		3.3K ohm	1
R202		1K ohm	1
R203		1K ohm	1
R204		1K ohm	1
R205		1K ohm	1
R206		1.2K ohm	1
R207		1K ohm	1
R208		1K ohm	1
R209		4.7K ohm	1
R210		100 ohm	1
R211		56 ohm	1
R212		10K ohm	1
R301		47K ohm	1
R302		2.2K ohm	1
R303		56K ohm	1
R304		2.7K ohm	1
R305		2.2K ohm	1
R306		39K ohm	1
R307		1K ohm	1
R308		82K ohm	1
R309		33K ohm	1
R310		100K ohm	1
R311		2.2K ohm	1
R312		820 ohm	1
R313		10K ohm	1
R314		470 ohm	1
R315		2.7K ohm	1
R316		82K ohm	1
R317		3.3K ohm	1
R318		56K ohm	1
R319		100K ohm	1
R320		47K ohm	1
R321		1K ohm	1
R322		8.2K ohm	1
R323		5.6K ohm	1
R324		3.3K ohm	1
R325		3.3K ohm	1
R326		270 ohm	1
R327		100K ohm	1
R328		3.3K ohm	1
R329		270K ohm	1
R331		270 ohm	1
R332		2.2K ohm	1
R333		2.2K ohm	1
R334		Flame Proof, 2.2 ohm ¼W	1
R335		Flame Proof, 2.2 ohm ¼W	1
R336		Flame Proof, 220 ohm ½W	1
R337		Flame Proof, 220 ohm ½W	1
R338		27K ohm	1
R339		47K ohm	1
R341		56K ohm	1
R342		56K ohm	1
R343		27K ohm	1
R344		12K ohm	1
R345		120K ohm	1
R346		39K ohm	1
R347		1K ohm	1
R348		100K ohm	1
R349		5.6K ohm	1
R350		5.6K ohm	1
R351		10K ohm	1
R352		10K ohm	1
R361		180K ohm	1
R362		12K ohm	1
R363		12K ohm	1
R346		56K ohm	1
R365		33K ohm	1
R366		10K ohm	1
R367		10K ohm	1

Ref. No.	Part No.	Description	Q'ty
SENSOR PRE–AMP., SERVO & EQUALIZER P. C. B. ASS'Y			
	RESISTORS		
R368		1K ohm	1
R369		22K ohm	1
R371		22K ohm	1
R372		82K ohm	1
R373		5.6K ohm	1
R374		22K ohm	1
R375		47K ohm	1
R376		Flame Proof, 3.9 ohm ¼W	1
R377		Flame Proof, 3.9 ohm ¼W	1
R381		1M ohm	1
R382		1M ohm	1
R383		470 ohm	1
R452		Flame Proof, 22 ohm ¼W	1
	CAPACITORS		
C101		Electrolytic 10µF ±20% 25V	1
C102		Ceramic 0.01µF +80–20% 50V	1
C103		Electrolytic 47µF 16V	1
C104		Ceramic 0.01µF +80–20% 50V	1
C105		Electrolytic 47µF 16V	1
C106		Ceramic 0.01µF +80–20% 50V	1
C107		Electrolytic 0.22µF 50V	1
C108		Mylar 0.0047µF ±10% 50V	1
C109		Metallized Polyester 0.22µF ±5% 50V	1
C201		Polypropylene 0.033µF ±5% 100V	1
C202		Ceramic 33pF ±5% 50V	1
C203		Polypropylene 0.033µF ±5% 100V	1
C204		Ceramic 120pF ±10% 50V	1
C205		Ceramic 56pF ±5% 50WV	1
C206		Ceramic 0.01µF +80–20% 50V	1
C207		Ceramic 0.01µF +80–20% 50V	1
C208		Electrolytic 4.7µF ±20% 25V	1
C209		Electrolytic 2.2µF 50V	1
C210		Ceramic 0.01µF +80–20% 50V	1
C211		Mylar 0.033µF ±20% 50V	1
C212	4-163T-10900	Electrolytic 4.7µF ±20% 35V Non-polar	1
C213		Mylar 0.022µF ±20% 50V	1
C214		Barrier Ceramic 0.1µF ±10% 25V	1
C215		Electrolytic 47µF ±20% 16V	1
C216		Ceramic 0.01µF +80–20% 50V	1
C217		Electrolytic 47µF ±20% 16V	1
C218		Ceramic 0.01µF +80–20% 50V	1
C301		Polypropylene 0.01µF ±5% 100V	1
C302		Polypropylene 0.01µF ±5% 100V	1
C303		Ceramic 33pF ±5% 50V	1
C304		Styrol 120pF ±5% 50V	1
C305		Styrol 120pF ±5% 50V	1
C306		Mylar 0.0068µF ±5% 50V	1
C307		Electrolytic 0.47µF ±20% 50V Non-polar	1
C308		Mylar 0.001µF ±5% 50V	1
C309		Mylar 0.0068µF ±5% 50V	1
C310		Mylar 0.022µF ±5% 50V	1
C311		Mylar 0.0047µF ±5% 50V	1
C312		Mylar 470pF ±10% 50V	1
C313		Ceramic 0.01µF +80–20% 50V	1
C314		Mylar 0.022µF ±5% 50V	1
C315		Mylar 0.047µF ±10% 50V	1
C317		Electrolytic 10µF ±20% 25V	1
C318		Electrolytic 4.7µF ±20% 25V Non-polar	1
C319		Electrolytic 1µF ±20% 50V Non-polar	1
C320		Electrolytic 47µF ±20% 16V	1
C321		Ceramic 0.01µF +80–20% 50V	1
C322		Electrolytic 47µF ±20% 16V	1
C323		Ceramic 0.01µF +80–20% 50V	1
C324		Electrolytic 100µF ±20% 16V	1

Ref. No.	Part No.	Description	Q'ty
SENSOR PRE–AMP., SERVO & EQUALIZER P. C. B. ASS'Y			
	CAPACITORS		
C325		Electrolytic 100µF ±20% 16V	1
C326		Ceramic 100pF ±5% 50V	1
C327		Ceramic 100pF ±5% 50V	1
C328		Electrolytic 100µF ±20% 10V	1
C329		Electrolytic 100µF ±20% 10V	1
C331		Electrolytic 47µF ±20% 16V	1
C332		Electrolytic 47µF ±20% 16V	1
C333		Mylar 0.001µF ±5% 50V	1
C341		Electrolytic 0.47µF ±20% 50V Non-polar	1
C342		Electrolytic 1µF ±20% 50V Non-polar	1
C343		Electrolytic 0.47µF ±20% 50V Nonpolar	1
C344		Electrolytic 1µF ±20% 50V Nonpolar	1
C345		Electrolytic 0.47µF ±20% 50V Nonpolar	1
C346		Electrolytic 0.47µF ±20% 50V Nonpolar	1
C361		Mylar 0.012µF ±5% 50V	1
C362		Mylar 0.056µF ±5% 50V	1
C363		Barrier Ceramic 0.1µF ±10% 25V	1
C364		Mylar 0.0082µF ±5% 50V	1
C365		Electrolytic 1µF ±20% 50V	1
C366		Electrolytic 47µF ±20% 16V	1
C367		Electrolytic 47µF ±20% 16V	1
C368		Electrolytic 47µF ±20% 16V	1
C371		Electrolytic 0.22µF ±20% 50V	1
C372		Mylar 0.068µF ±5% 50V	1
C381		Electrolytic 0.47µF ±20% 50V	1
C382		Electrolytic 1µF ±20% 50V	1
C383		Electrolytic 10µF ±20% 50V	1
C451		Barrier Ceramic 0.012µF ±10%	1
C452		Barrier Ceramic 0.022µF ±10%	1
DIGITAL AUDIO P. C. B. ASS'Y			
83	141-4-280T-19271	P.C.B. Ass'y, Digital Audio	1
IC501		Integrated Circuit µPD1511C–144	1
IC502		Integrated Circuit LC4001B	1
IC503		Integrated Circuit M54539P	1
IC504		Integrated Circuit LC4011B	1
IC601		Integrated Circuit MB62131	1
IC602		Integrated Circuit CX9733	1
IC603		Integrated Circuit CX7934	1
IC604		Integrated Circuit CX7935	1
IC605		Integrated Circuit MB8128–15	1
IC606		Integrated Circuit M74LS00P	1
IC607		Integrated Circuit LC4001B	1
IC701		Integrated Circuit CX20017	1
IC702		Integrated Circuit LF353N	1
IC703		Integrated Circuit LF353N	1
IC704		Integrated Circuit µPD4053BC	1
IC705,706		Integrated Circuit AFL89WB20000C3	2
IC707		Integrated Circuit NE5532AP	1
IC708		Integrated Circuit NJM4556D	1
IC709		Integrated Circuit NJM78L05A	1
IC710		Integrated Circuit NJM79M05A	1
Q501		Transistor 2SC536AUD G	1
Q502		Transistor 2SB598E or 2SB598F	1
Q503,511 512,513, 514,515 551		Transistor 2SC536AUD G	7
Q552,553 554,555		Transistor 2SA984E	4
Q601		Field Effect Transistor 2SK222E	1
Q602,603 604		Transistor 2SC930E	3

Ref. No.	Part No.	Description	Q'ty
DIGITAL AUDIO P. C. B. ASS'Y			
Q701,702		Field Effect Transistor 2SK152-4 or 2SK152-3 (Q701 & 702 : a pair)	2
Q801,802		Transistor 2SC536AUD KG	2
D511		Diode GMA01	1
D601		Variable Capacitornce Diode 1SV53A	1
D602		Diode GMA01	1
D701		Zener Diode MTZ6.2C	1
D702		Zener Diode MTZ6.2C	1
D801,802		Diode GMA01	2
L501	4-253T-12720	Filter 10μH	1
L601	4-253T-12714	Filter 3.3μH	1
L602	4-253T-15028	Filter 47μH	1
L603	4-253T-15028	Filter 47μH	1
L701	4-253R-11100	Choke Coil 1μH	1
T601	4-256T-30430	IF Transformer	1
X501	4-266T-00400	Ceramic Resonator 3.58MHz	1
X601	4-225T-04200	Crystal, 8.64MHz	1
X701	4-225T-05300	Crystal 35.002MHz	1
RY801	4-232T-07200	Relay	1
RY802	4-232T-07200	Relay	1
	4-240T-50381	Socket, OUTPUT	1
CNS7	4-240T-61600	Socket, 2p Sensor Pre-amp., Servo & Equalizer P. C. B.	1
CNS8	4-240T-61500	Socket 9p Sensor Pre-amp., Servo & Equalizer P. C. B.	1
CNP9	4-236T-24478	Plug 8p System Control P.C.B.	1
CNP13	4-236T-19774	Plug 6p Stepping Motor	1
CNP14	4-236T-24473	Plug 3p Limit Switch P.C.B.	1
CNP15	4-236T-24472	Plug 2p Pick-up Fixing Switch P. C. B.	1
CNP16	4-236T-24478	Plug 8p Phones Socket P.C.B.	1
CNP19	4-236T-24474	Plug 4p Power Supply P. C. B.	1
CNP20	4-236T-24476	Plug 6p Power Supply P. C. B.	1
CNS21	4-240T-63100	Socket 2p Sensor Pre-amp., Servo & Equalizer P. C. B.	1
CNP27	4-236T-24474	Plug 4p Output Socket & Auto Function Socket P.C.B.	1
TP2	4-236T-10293	Plug 2p	1
TP6	4-236T-10271	Plug 4p	1
RA501,502	4-221T-07775	Resistor 10K ohm x 8	2
SVR501	4-222T-62087	Semi-fixed Resistor 47K ohm Pause Adj.	1
SVR601	4-222T-62075	Semi-fixed Resistor 47K ohm PLL Adj.	1
	RESISTORS		
	All Resistors are Carbon type ±5%, 1/6W unless otherwise noted.		
R501		10K ohm	1
R502		10K ohm	1
R503		220 ohm	1
R504		10K ohm	1
R505		1K ohm	1
R506		1K ohm	1
R507		Metal Oxide 270 ohm 2W	1
R508		1K ohm	1
R509,510		10K ohm	2
R511		82K ohm	1
R512,513,514		10K ohm	3
R515		47K ohm	1
R516		22K ohm	1
R517,518		47K ohm	2
R519		5.6K ohm	1
R520		10K ohm	1
R521		47K ohm	1
R522,523		10K ohm	2
R551		33K ohm	1
R552,553,554,555,556,557,558,559		1K ohm	8

Ref. No.	Part No.	Description	Q'ty
DIGITAL AUDIO P. C. B. ASS'Y			
	RESISTORS		
R560,561,562,563		10K ohm	4
R601		3.3K ohm	1
R602		3.9K ohm	1
R603		1K ohm	1
R604		10K ohm	1
R605		1K ohm	1
R606		150 ohm	1
R607		1K ohm	1
R608		33K ohm	1
R609		12K ohm	1
R610		2.2K ohm	1
R611		39K ohm	1
R612		8.2K ohm	1
R613		560 ohm	1
R614		100 ohm	1
R615		820 ohm	1
R616		10K ohm	1
R617		390K ohm	1
R701		100 ohm	1
R702		Metal 56K ohm ±1% ¼W	1
R703		1.8K ohm	1
R704		4.7K ohm	1
R705		4.7K ohm	1
R711,712		Metal 15K ohm ±1% ¼W	2
R713,714		Metal 27K ohm ±1% ¼W	2
R715,716		1.5K ohm	2
R717,718		Metal 15K ohm ±1% ¼W	2
R719		Metal 390K ohm ±1% ¼W	1
R721,722		Metal 4.7K ohm ±1% ¼W	2
R723,724		Metal 1.8K ohm ±1% ¼W	2
R725,726		Metal 330 ohm ±1% ¼W	2
R727,728		Metal 150K ohm ±1% ¼W	2
R729,730		Metal 100K ohm ±1% ¼W	2
R731,732		Metal 470 ohm ±1% ¼W	2
R733,734		1K ohm	2
R735,736		100K ohm	2
R737,738		10K ohm	2
R739,740		3.9K ohm	2
R741,742		Flame Proof, 220 ohm ¼W	2
R743,744		Metal 12K ohm ±1% ¼W	2
R751		Metal Oxide, 47 ohm 1W	1
R801,803		10K ohm	2
R802,804		47K ohm	2
	CAPACITORS		
C501,502		Ceramic 20pF ±5% 50V	2
C503		Electrolytic 100μF ±20% 10V	1
C504		Ceramic 0.01μF +80–20% 50V	1
C505		Electrolytic 470μF ±20% 16V	1
C506		Mylar 0.033μF ±10% 50V	1
C507,508		Ceramic 0.01μF +80–20% 50V	2
C511		Electrolytic 2.2μF ±20% 50V	1
C521		Mylar 0.022μF ±10% 50V	1
C522		Mylar 0.022μF 10% 50V	1
C551,552,553,554		Electrolytic 100μF ±20% 16V	4
C601,602		Ceramic 39pF ±5% 50V	2
C603		Mylar 0.033μF ±5% 50V	1
C604		Mylar 0.0015μF ±5% 50V	1
C605		Ceramic 47pF ±5% 50V	1
C606,607		Ceramic 56pF ±5% 50V	2
C608		Ceramic 33pF ±5% 50V	1
C609,610		Ceramic 0.01μF +80–20% 50V	2
C611		Electrolytic 470μF ±20% 10V	1
C612,613,614,615,616,617,618		Ceramic 0.01μF +80–20% 50V	7
C619,620		Electrolytic 33μF ±20% 16V	2
C621,622		Ceramic 0.047μF +80–20% 50V	2
C623		Electrolytic 1μF ±20% 50V	1
C700		Ceramic 0.047μF +80–20% 50V	1
C701,702		Electrolytic 33μF ±20% 16V	2
C703		Electrolytic 1μF ±20% 50V	1
C704		Electrolytic 33μF ±20% 16V	1

Ref. No.	Part No.	Description	Q'ty
DIGITAL AUDIO P. C. B. ASS'Y			
	CAPACITORS		
C705		Electrolytic 4.7µF ±20% 25V	1
C706		Electrolytic 33µF ±20% 16V	1
C707		Ceramic 47pF ±5% 50V	1
C708		Ceramic 47pF ±5% 50V	1
C709		Ceramic 0.001µF ±10% 50V	1
C710		Ceramic 18pF ±5% 50V	1
C711,712	4-223T-15400 or 4-223T-14500	Capacitor 0.001µF ±5% 100V	2
C713,714		Electrolytic 1µF ±20% 50V	2
C715,716		Mica 68pF ±5% 500V	2
C717,718	4-223T-14300	Capacitor 0.01µF ±5% 400V	2
C719,720	4-163T-09400 or 4-163T-09471	Capacitor 4.7µF ±20% 50V	2
C721,722		Electrolytic 1µF ±20% 50V	2
C731,732	4-163T-10300 or 4-163T-10371	Electrolytic 22µF ±20% 25V	2
C733		Electrolytic 1µF ±20% 50V	1
C734		Electrolytic 100µF ±20% 16V	1
C735,736		Electrolytic 100µF ±20% 10V	2
C737,738		Electrolytic 1µF ±20% 50V	2
C739,740, 741,742	4-163T-10300 or 4-163T-10371	Electrolytic 22µF ±20% 25V	4
C751		Ceramic 0.047µF +80—20% 50V	1
C752		Ceramic 0.022µF +80—20% 50V	1
PHONES LEVEL CONTROL & PHONES SOCKET P. C. B. ASS'Y			
84	141-4-280T-32780	P.C.B. Ass'y, Phones Level Control & Phones Socket	1
	4-240T-63081	Socket, Phones	1
	4-240T-72500	Socket, 8p, Digital Audio PCB	1
VR701,702	4-220T-09200	Variable Resistor, Phones Level 50K ohm	1
	CAPACITORS		
C753,754		Ceramic 0.022µF +80—20% 50V	2
PICK—UP FIXING SWITCH P. C. B. ASS'Y			
85	141-4-280T-19480	P.C.B. Ass'y, Pick-up Fixing Switch	1
S501	4-238T-66400	Switch, Pick-up Fixing	1
CNS15	4-240T-74100	Socket, 2p, Digital Audio PCB	1
SYSTEM CONTROL P. C. B. ASS'Y			
86	141-4-280T-35700	P.C.B. Ass'y, System Control	1
IC401		Integrated Circuit LM6402H—274	1
Q401		Transistor 2SC536AUD G	1
Q402		Transistor 2SD734F	1
Q403		Transistor 2SC536AUD G	1
Q404		Transistor 2SD734F	1
Q405		Transistor 2SC536AUD G	1
Q406		Transistor 2SD734F	1
Q407		Transistor 2SB598F	1
Q408		Transistor 2SC536AUD G	1
Q441		Transistor 2SC536AUD G	1
Q442		Transistor 2SC536AUD G	1
Q443		Transistor 2SC536AUD G	1
D401		Diode GMA01	1
D441		Diode GMA01	1
D442		Diode GMA01	1
L401	4-253T-15020	Filter 10µH	1
X401	4-266T-00100	Ceramic Resonator	1
CNP5-1	4-236T-24478	Plug 8p Key Switch & LED PCB	1
CNP5-2	4-236T-24481	Plug 11p Key Switch & LED PCB	1

Ref. No.	Part No.	Description	Q'ty
SYSTEM CONTROL P. C. B. ASS'Y			
CNS6	4-240T-61700	Socket, 2p Sensor Pre-amp., Servo & Equalizer PCB	1
CNS9	4-240T-61800	Socket 8p Digital Audio PCB	1
CNP10	4-236T-24477	Plug 7p Mechanism Switches	1
CNP18	4-236T-24474	Plug 4p Power Supply PCB	1
CNP23	4-236T-24473	Plug 3p Auto Function Socket PCB	1
CNS24	4-240T-70300	Socket 7p Initial Stop PCB	1
CNS25	4-240T-70971	Socket 2p Initial Stop PCB	1
	141-2-352T-66900	Spacer Fiber Sheet PCB mtg.	1
RA401	4-221T-07771	Resistor 10K ohm x 4	1
RA402	4-221T-07774	Resistor 10K ohm x 7	1
	RESISTORS		
R401		*M ohm	1
R403		*0K ohm	1
R404		*0K ohm	1
R405		*0K ohm	1
R406		*K ohm	1
R407		33K ohm	1
R408		*0K ohm	1
R409		*K ohm *	1
R410		33K ohm	1
R411		*0K ohm	1
R412		*K ohm	1
R413		33K ohm	1
R414		2.2K ohm	1
R415		330 ohm	1
R416		10K ohm	1
R417		1K ohm	1
R418		33K ohm	1
R440,441		33K ohm	2
R442		330K ohm	1
R443		820 ohm	1
R444		2.7K ohm	1
R445		330K ohm	1
R446		47K ohm	1
R447		47K ohm	1
	CAPACITORS		
C401,402		Ceramic 220pF ±5% 50V	2
C403,404		Ceramic 0.01µF +80—20% 50V	2
C405,406		Ceramic 0.01µF +80—20% 50V	2
C407		Ceramic 100pF ±5% 50V	1
C408,409		Electrolytic 100µF ±20% 10V	2
C410		Ceramic 0.01µF +80—20% 50V	1
C411		Electrolytic 47µF ±20% 16V	1
C412		Ceramic 0.01µF +80—20% 50V	1
C413		Electrolytic 47µF ±20% 16V	1
KEY SWITCH & LED P. C. B. ASS'Y			
87	141-4-280T-32900	P.C.B. Ass'y, Key Switch & LED	1
D 1		LED SLP245C—50U Green TRACK No. 1	1
D 2		LED SLP245C—50U Green TRACK No. 2	1
D 3		LED SLP245C—50U Green TRACK No. 3	1
D 4		LED SLP245C—50U Green TRACK No. 4	1
D 5		LED SLP245C—50U Green TRACK No. 5	1
D 6		LED SLP245C—50U Green TRACK No. 6	1
D 7		LED SLP245C—50U Green TRACK No. 7	1
D 8		LED SLP245C—50U Green TRACK No. 8	1
D 9		LED SLP245C—50U Green TRACK No. 9	1
D10		LED SLP245C—50U Green TRACK No. 10	1
D11		LED SLP245C—50U Green TRACK No. 11	1

Ref. No.	Part No.	Description	Q'ty
KEY SWITCH & LED P. C. B. ASS'Y			
D12		LED SLP245C–50U Green TRACK No. 12	1
D13		LED SLP245C–50U Green TRACK No. 13	1
D14		LED SLP245C–50U Green TRACK No. 14	1
D15		LED SLP245C–50U Green TRACK No. 15	1
D16		LED SLP245C–50U Green TRACK No. 16	1
D17		LED SLP945C–50 Red, PAUSE	1
D18		LED SLP245C–50U Green PLAY	1
D19		LED SLP245C–50U Green REPEAT	1
D20		LED SLP984A–51 Red DISC IN	1
D21		LED SLP984A–51 Red DISC IN	1
D421,422, 423		Diode DS442X	3
S1 ~ 10	4-238T-69800	Switch, OPEN/CLOSE, STOP, PLAY, PAUSE, FWD ACCESS, BACK ACCESS, REPEAT, MEMORY, CLEAR, PROGRAM	10
CNS5-1	4-240T-62800	Socket, 8p, System Control PCB	1
CNS5-2	4-240T-62900	Socket, 11p, System Control PCB	1
	141-2-210T-55100	Bracket, TRACK NO. LED	
	141-2-352T-58600	Spacer, PLAY, PAUSE LED	5
	RESISTORS		
	All Resistors are Carbon type ±5%, ¼W unless otherwise noted.		
R421,422, 423,424, 425,426, 427,428, 429,430		220 ohm	10
R431		390 ohm	1
R432		150 ohm	1
POWER SUPPLY P. C. B. ASS'Y			
88	141-4-280T-19573	P.C.B. Ass'y, Power Supply	1
IC901		Integrated Circuit NJM7805A	1
IC902		Integrated Circuit NJM78M09A	1
IC903		Integrated Circuit NJM79M09A	1
IC904		Integrated Circuit NJM78M09A	1
IC905		Integrated Circuit NJM79M09A	1
Q851,852 853		Transistor 2SC536AUD G	3
Q901		Transistor 2SD400E	1
D851,852		Diode GMA01	2
D853		Zener Diode GZA2.4Z	1
D901	4-202T-05400	⚠ Diode DBA30CK12	1
D902	4-202T-05500	⚠ Diode DBA20CK15	1
D903,904 905,906		Diode DSF10C	4
D907		Zener Diode MTZ11B	1
L951	4-253T-15800	⚠ Filter 600µH	1
CNS17	4-240T-62100	Socket 6p Sensor Pre-amp., Servo & Equalizer PCB	1
CNS18	4-240T-62200	Socket 4p System Control PCB	1
CNS19	4-240T-62300	Socket 4p Digital Audio PCB	1
CNS20	4-240T-62400	Socket 6p Digital Audio PCB	1
	141-2-381T-04200	Bracket Fuse	6
	4-237T-00100	Terminal Board	7
	141-2-382T-18900	Terminal	4
	RESISTORS		
	All Resistors are Carbon type ±5%, 1/6W unless otherwise noted.		
R851		5.6K ohm	1
R852		5.6K ohm	1

Ref. No.	Part No.	Description	Q'ty
POWER SUPPLY P. C. B. ASS'Y			
	RESISTORS		
R853		15K ohm	1
R854		100K ohm	1
R855		39K ohm	1
R856		100 ohm	1
R857,858. 859		10K ohm	3
R901		Flame Proof 2.2 ohm ¼W	1
R902		560 ohm	1
	CAPACITORS		
C851		Electrolytic 2.2µF ±20% 50V	1
C852		Electrolytic 33µF ±20% 16V	1
C901		Mylar 0.1µF ±20% 50V	1
C902,903, 904,905		Ceramic 0.01µF +80–20% 50V	4
C906		Mylar 0.01µF ±20% 250V	1
C907	4-163T-10600 or 4-163T-10671	Electrolytic 6800µF ±20% 16V	1
C908		Ceramic 0.01µF +80–20% 50V	1
C909		Electrolytic 0.47µF ±20% 50V	1
C910		Electrolytic 1000µF ±20% 10V	1
C911,912		Electrolytic 2200µF ±20% 16V	2
C913,914		Electrolytic 0.47µF ±20% 50V	2
C915,916		Electrolytic 470µF ±20% 16V	2
C917,918		Electrolytic 100µF ±20% 16V	2
C919,920		Electrolytic 0.47µF ±20% 50V	2
C921,922	4-163T-11000 or 4-163T-11171	Electrolytic 470µF ±20% 16V	2
C923		Electrolytic 33µF ±20% 16V	1
C924		Electrolytic 2.2µF ±20% 50V	1
POWER SWITCH P. C. B. ASS'Y			
89	141-4-280T-19673	P.C.B. Ass'y, Power Switch	1
S1	4-238T-64200	⚠ Switch POWER	1
	141-2-382T-18900	Terminal	2
INITIAL STOP P. C. B. ASS'Y			
90	141-4-280T-38101	P.C.B. Ass'y, Initial Stop	1
IC403		Integrated Circuit LC4011B	1
IC404		Integrated Circuit LC4069UB	1
Q481		Transistor 2SA608E or 2SA608F	1
Q482		Transistor 2SC536AUD F or G	1
Q483		Transistor 2SA608E or 2SA608F	1
D481		Diode GMA01	1
CNP24	4-236T-24477	Plug 7p System Control PCB	1
CNP25	4-236T-24472	Plug 2p System Control PCB	1
	RESISTORS		
	All Resistors are Carbon type ±5%, 1/6W unless otherwise noted.		
R481		470K ohm	1
R482		3.3K ohm	1
R483		100K ohm	1
R484		3.3K ohm	1
R485		10K ohm	1
R486		150K ohm	1
R487,488		3.3K ohm	2
R489		10K ohm	1
R490		22K ohm	1
	CAPACITORS		
C481,482, 483		Electrolytic 1µF ±20% 50V	3
C484		Ceramic 0.01µF +80–20% 50V	1

Ref. No.	Part No.	Description	Q'ty
LAMP P. C. B. ASS'Y			
91	141-4-280T-19700	P.C.B. Ass'y, Lamp	1
PL 2	4-612T-17500	Lamp 12V 70mA	1
OUTPUT SOCKET & AUTO FUNCTION SOCKET P. C. B. ASS'Y			
92	141-4-280T-39900	P.C.B. Ass'y, Output Socket & Auto Function Socket	1
	4-240T-50391	Socket, Output	1
	4-240T-65300	Socket, Auto Function	1
CNS23	4-240T-63200	Socket, System Control PCB	1
CNS27	4-240T-71500	Socket, Digital Audio PCB	1
	CAPACITORS		
C752		Ceramic 0.047μF +80–20% 50V	2
DISC SWITCH P. C. B. ASS'Y (MECHANIS)			
93	141-4-280T-18600	P.C.B. Ass'y, Disc Switch (MECHANISM)	1
PC–2	4-202T-50200	Photo Interrupter	1
LIMIT SWITCH P. C. B. ASS'Y (MECHANISM)			
94	141-4-280T-18700	P.C.B. Ass'y, Limit Switch	1
PC–1	4-202T-51000	Photo Interrupter	1
CNS14	4-240T-61000	Socket 3p, Limit Swith	1
OPEN/CLOSE SWITCH P. C. B. ASS'Y			
95	141-4-280T-33100	P.C.B. Ass'y, Open/Close Seitch	1
S1	4-238T-69800	Switch, OPEN/CLOSE	1

Safety notice:

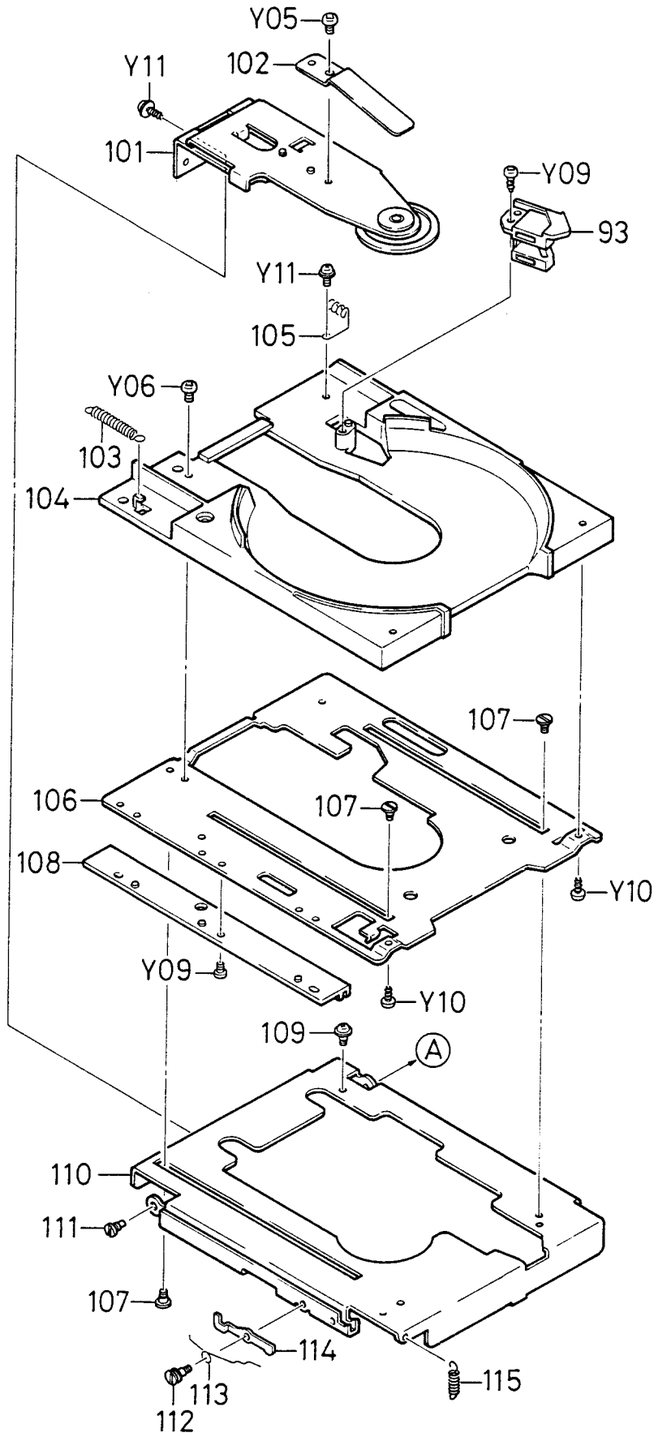
All parts bearing the ⚠ symbol were manufactured to conform to special safety standards. When replacing, do not use parts numbers other than those specified.

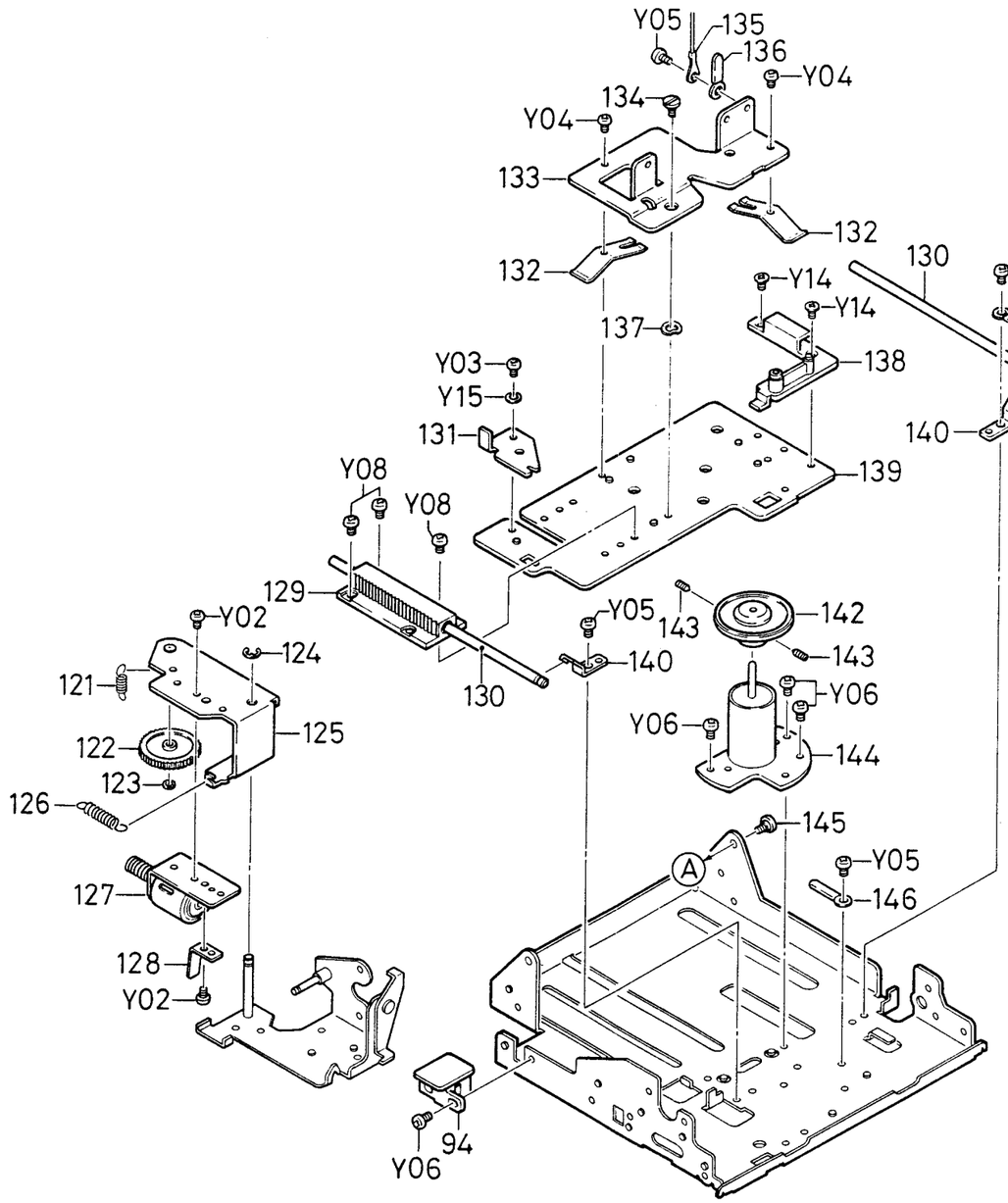
15. PARTS LIST (MECHANISM)

Ref. No.	Part No.	Description	Q'ty
MECHANISM (PM–DAD04)			
101	141-0-310T-93001	Chuck Lever with Bracket	1
102	141-2-853T-86300	Spring Plate, Chuck Lever mtg.	1
103	141-2-856T-36300	Spring Coil Disc Tray mtg.	1
104	141-0-210T-54200	Disc Tray, Compact Disc	1
105	141-2-852T-94500	Spring Wire, Lead mtg.	1
106	141-2-732T-21800	Slide, Disc Tray	1
107	141-2-421T-51100	Special Screw, Slide mtg.	3
108	141-2-581T-35000	Gear, Disc Tray Lac	1
109	141-2-421T-36901	Special Screw, Disc Tray mtg.	1
110	141-2-740T-10900	Lever, Disc Tray Base	1
111	141-2-421T-51300	Special Screw, Lever, Disc Tray Base mtg.	1
112	141-2-421T-51400	Special Screw, Lever, Tray Stopper mtg.	1
113	141-2-852T-90700	Spring Wire, Lever, Tray Stopper mtg.	1
114	141-2-740T-11400	Lever, Tray Stopper	1
115	141-2-856T-31700	Spring Coil, Disc Tray mtg.	1
121	141-2-856T-21300	Spring Coil, Stepping Motor mtg.	1
122	141-2-581T-29000	Gear, Stepping Motor	1
123	141-2-453T-33100	Special Washer, GNW., Gear mtg. 1.6 x 3.2 x 0.25mm	1
124	141-2-457T-23200	Special Washer, " E " Ring 4mm	1
125	141-0-740T-11000	Lever, Stepping Motor mtg.	1
126	141-2-856T-31800	Spring Coil, Lever, Stepping Motor mtg.	1
127	4-527T-20602	Stepping Motor	1
128	141-2-853T-82000	Spring Plate, Stepping Motor	1
129	141-0-581T-35100	Gear, Rail Guide	1
130	141-2-754T-56800	Shaft, Pick-up Rail	2
131	141-2-310T-95000	Bracket, Limit Switch	1
132	141-2-853T-86200	Spring Plate, Skew Adjustment	2
133	141-2-310T-93300	Bracket, Pick-up mtg.	1
134	141-2-421T-51200	Special Screw, Supporting Point	1
135	4-237T-11200	Terminal, Ground	1
136	141-2-472T-01001	Lug, Lead mtg.	1
137	141-2-457T-43700	Special Washer, GNW., Skew Adj. 4.3 x 8 x 1.5mm	1
138	141-2-210T-52900	Bracket, Rail Guide	1
139	141-2-310T-93400	Bracket, Pick-up Base	1
140	141-2-853T-86100	Spring Plate, Pick-up Rail mtg.	2
141	141-2-472T-01201	Lug, Lead mtg.	1
142A	141-2-118T-03000	┌Turn Table, Compact Disc (153A : pair used)	1
143A		└Hexagon Socket Set Screw, 2.6 x 6mm, Turn Table mtg.	2
	141-9-118T-03001	Turn Table Ass'y	1
142B	141-2-118T-03001	├ Turn Table, Compact Disc (143B : pair used)	1
143B		└ Hexagon Socket Set Screw, 3 x 8mm, Turn Table mtg.	2
144	4-527T-24000	Spindle Motor, Compact Disc	1
145	141-2-421T-49800	Special Screw, Lever Disc Tray Base mtg.	1
146	123-2-472R-00601	Lug, Lead mtg.	1
201	141-0-310T-93200	Bracket, Shutter Guide, Left Side	1
202	141-2-581T-34800	Gear, Cam, Loading	1
203	141-2-457T-23600	Special Washer, " E " Ring, 2.5mm, Gear, Cam mtg.	1
204	141-2-457T-23000	Special Washer, " E " Ring, 2mm Gear mtg.	1
205	141-2-581T-34900	Gear, Loading Motor Reduction	1
206	141-0-310T-93500	Bracket, Loading Motor Reduction Gear mtg.	1
207	141-2-853T-86400	Spring Plate, Gear	1
208	141-2-581T-11303	Gear, Loading Motor Reduction	1
209	141-2-453T-31600	Special Screw, GNW., Gear mth. 1.6 x 4 x 0.25mm	1
210	141-2-457T-23800	Special Washer, " E " Ring , 1.5mm Pulley mtg.	1
211	141-2-453T-31200	Washer, 2 x 8.5 x 0.25mm, Pulley mtg.	1
212	141-2-661T-26700	Pulley, Loading Motor Reduction	1
213	141-2-564T-33800	Square Belt, Loading Motor	1
214	141-0-310T-93600	Bracket, Loading Motor	1

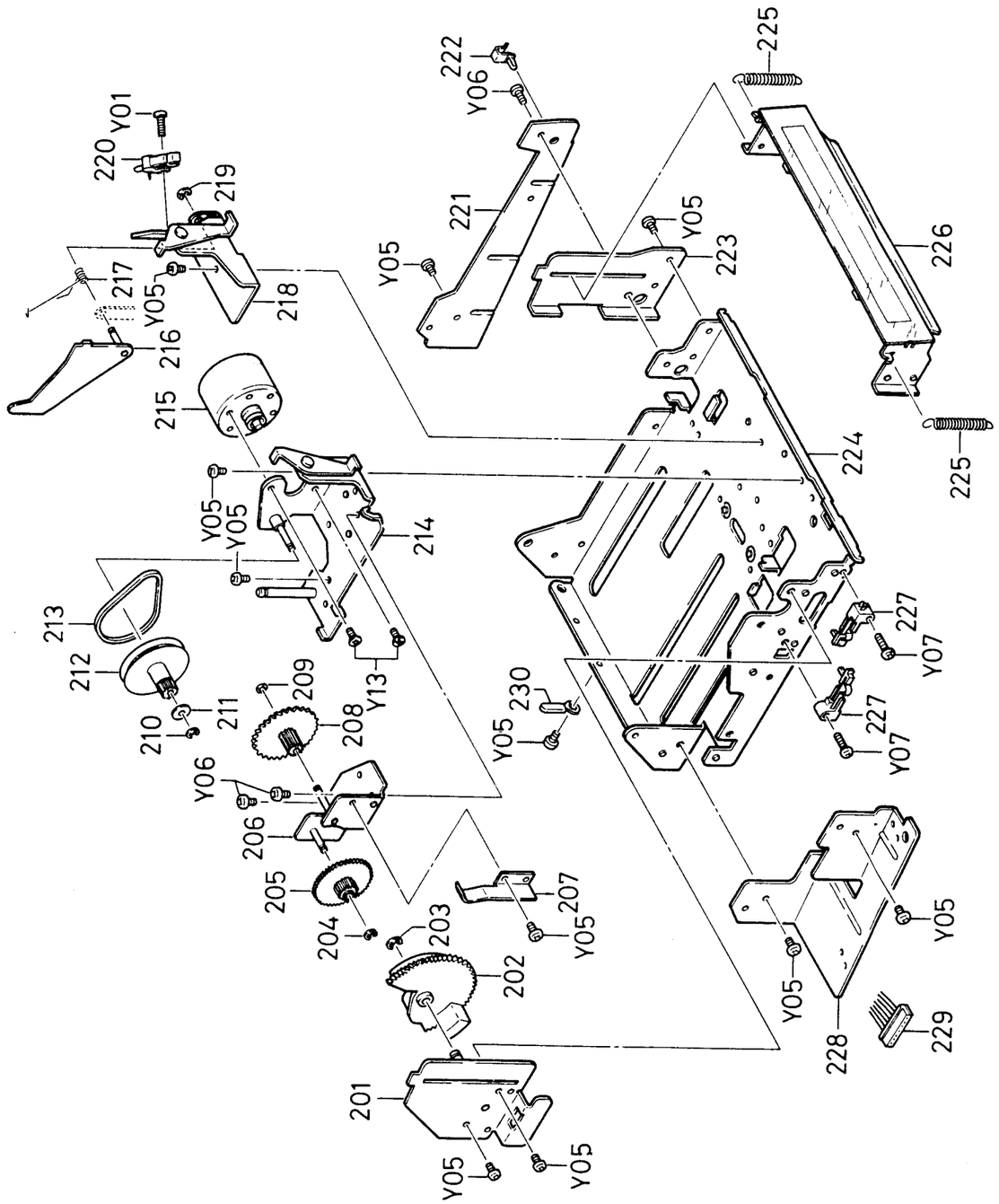
Ref. No.	Part No.	Description	Q'ty
MECHANISM (PM–DAD04)			
215	4-527T-24200	Loading Motor	1
216	141-2-740T-10800	Lever, Disc Tray Base Stopper	1
217	141-2-852T-90200	Spring Wire, Lever, Disc Tray Base Stopper mtg.	1
218	141-2-310T-94000	Bracket, Disc Tray Base Stopper	1
219	141-2-457T-23000	Special Washer, " E " Ring, 2mm, Bracket mtg.	1
220(S4-3)	4-231T-78500	Switch, Disc Tray Lever	1
221	141-2-310T-93800	Bracket, Mechanism, Right Side	1
222	141-2-464T-39500	Fixer, Lead mtg.	1
223	141-2-310T-93700	Bracket, Shutter Guide, Right	1
224	141-2-311T-47000	Chassis, Mechanism	1
225	141-2-856T-31500	Spring Coil, Shutter, Disc Tray mtg.	2
226	141-2-310T-94300	Shutter, Disc Tray	1
227(S4-1,4-2)	4-238T-75800	Switch, Tray Open	2
228	141-2-310T-93900	Bracket, Mechanism Left Side	1
229(CNS10)	4-240T-60800	Socket, 7p, Switches	1
230	141-2-472T-01201	Lug, Lead mtg.	1
FIXING PARTS			
Y01		Pan Hd. Screw, 2 x 8mm	1
Y02		Pan Hd. Screw, 2.6 x 3mm	2
Y03		Pan Hd. Screw, 2.6 x 4mm	1
Y04		Pan Hd. Screw, 2.6 x 8mm	2
Y05		Pan Hd. Forming Screw, 3 x 4mm	16
Y06		Pan Hd. Forming Screw, 3 x 6mm	8
Y07		Pan Hd. Forming Screw, 3 x 10mm	2
Y08		Pan Hd. Screw w/Spring Washer 2.6 x 4mm	3
Y09		Pan Hd. Tapping Screw, 2.6 x 6mm	2
Y10		Pan Hd. Tapping Screw, 3 x 6mm	2
Y11		Pan Hd. Tapping Screw w/Washer 3 x 6mm	2
Y12		(Not used)	
Y13		Flat Hd. Screw, 2.6 x 4mm	2
Y14		Flat Hd. Screw, 2.6 x 3.5mm	2
Y15		Spring Washer, 2.6 x 5.3 x 0.7mm	1

16. EXPLODED VIEWS (MECHANISM) (1)





EXPLODED VIEWS (MECHANISM) (2)



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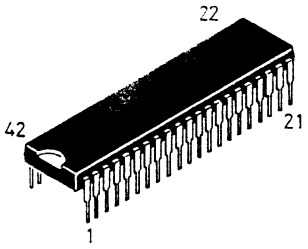
Osaka-fu, 570 Japan.

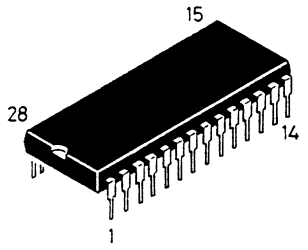
Mar./'84/1500 KM Printed in Japan.

MODEL CP300 CP300X WIRING DIAGRAM① (PICK-UP

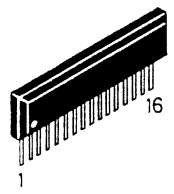
IC401.....LM6402H



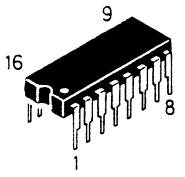
IC301.....LA9100



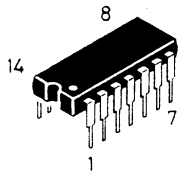
IC302 .....,.....STK6922



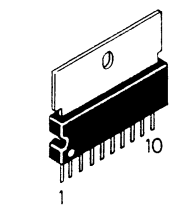
IC101.....LA9000
IC201.....LA9010



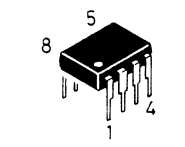
IC303.....LA6324
IC305,403.....LC4011B
IC404.....LC4069UB



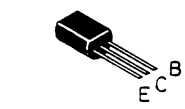
IC402.....BA6109



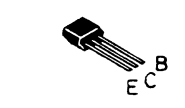
IC102.....NJM4558DD
IC121.....LA6358
IC304.....LA6458D



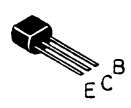
Q303.....2SD438
Q304.....2SB560



Q101.....2SC536
Q123,481,
483.....2SA608



Q122,407.....2SB598
Q201.....2SC930
Q302.....2SA608
Q361.....2SD600
Q362.....2SB631
Q402,404,406.....2SD734
Q371,372,373
374,401,403
405,408,482
441,442,443
301,.....2SC536



Q121.....2SD612

TO DIGITAL AUDIO P.C.B.

CN 7

SENSER PRE-AMP, SERVO & EQUALIZER

CN 3

CN8

TO DIGITAL AUDIO P.C.B.

LASER POWER P.C.B.

CN1

CN2

CN3

CN4

PICK-UP

MECHAN

UP•SERVO & SYSCON)

8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17

TO POWER SUPPLY P.C.B.

TO DIGITAL AUDIO P.C.B.

CN21

CN17

CN6

CN12

CN11

CN1

SPINDLE MOTOR DC 3.5V

LOADING MOTOR DC 9V

M

LIMIT SW P.C.B.

PC-1

CN14

TO DIGITAL AUDIO P.C.B.

ECHANISM

INITIAL STOP P.C.B.

CN24

CN25

OPEN / CLOSE S1

CN28

OPEN / CLOSE P.C.B.

AUTO FUNCTION SOCKET P.C.B.

CN23

TO DIGITAL AUDIO P.C.B

CN10

PC-2

DISC SW P.C.B.

CN9

CN5-1

CN5-2

IC401

IC402

IC102

IC 101

SYSTEM CONTROL P.C.B.

CN18

TO POWER SUPPLY P.C.B.

S3-1 PLAY

S3-2 PLAY

PAUSE S4

STOP S2

FWD ACCESS S5

S6 BACK ACCESS

S7 REPEAT

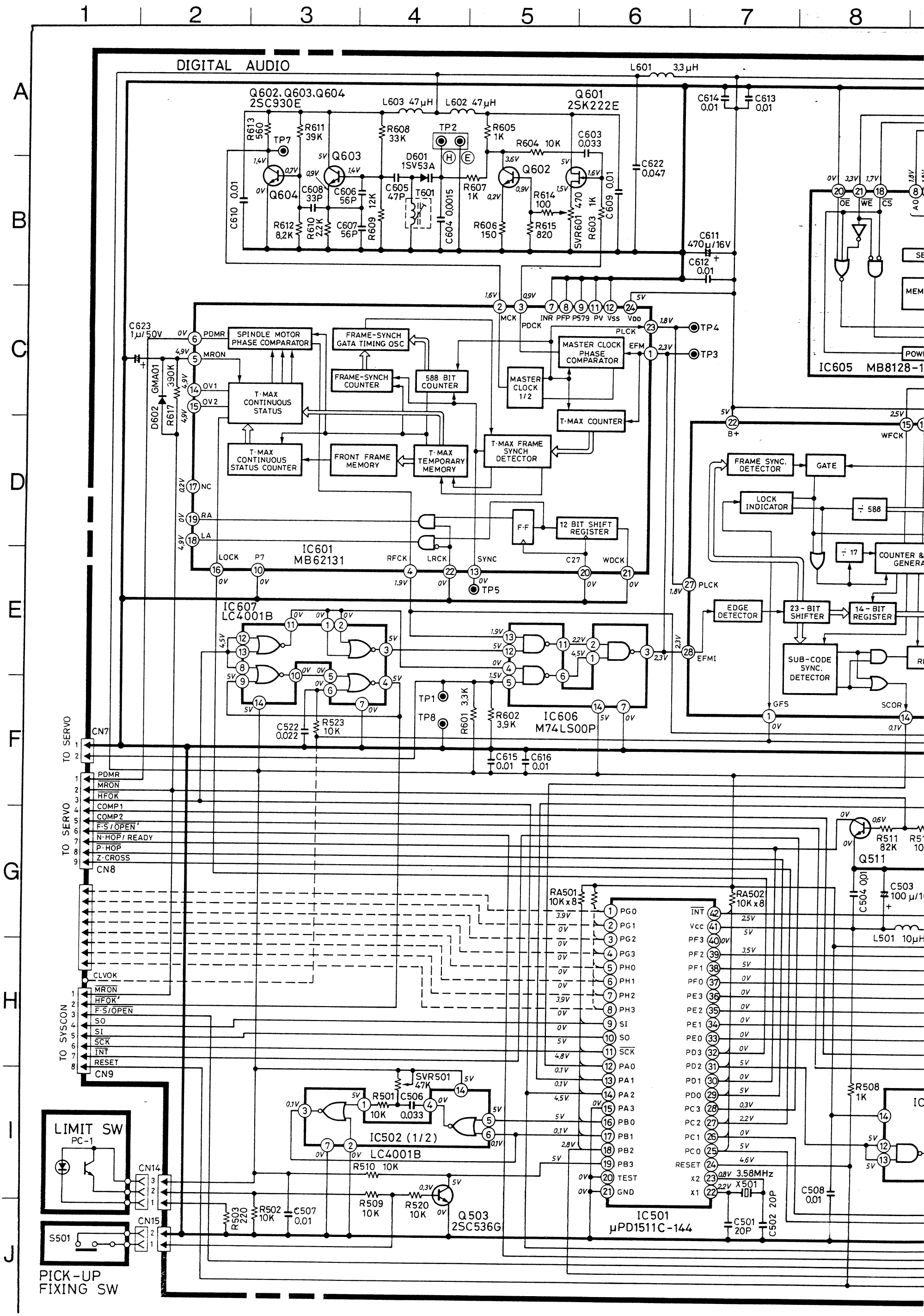
PROGRAM S10

MEMORY S8

CLEAR S9

KEY SWITCH & LED P.C.B

MODEL CP300 CP300X SCHEMATIC DIAGRAM② (DIGITAL



GITAL AUDIO 1)

8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17

C618 0.01
C617 0.01
C620 33µ/16V
C621 0.047
C619 33µ/16V

IC603 CX7934

SELECTOR (ROW)
MEMORY 128 ROW 128 COLUMN CELL ARAY
SELECTOR (COLUMN) I/O
IN-PUT CONTROL
POWER DOWN DETECT
MB8128-15

RAM ADDRESS GENERATOR
TIMING & CONTROL SIGNAL GENERATOR
INTERPOLATOR
PARALLEL/ SERIAL CONVERTER
CLOCK GENERATOR
X601 8.64 MHz
C602 39P
C601 39P
TEST CIRCUIT

÷ 588
WINDOW GENERATOR
SELECTOR
SELECTOR & COUNTER
COUNTER & TIMING GENERATOR
14 - BIT REGISTER
14 → 8 DECORDER
POLARITY CONTROL
8 - BIT REGISTER
8 - BIT REGISTER
8 - BIT SHIFT REGISTER

IC602 CX7933

DATA - POINTER ADDRESS GENERATION
MICRO - PROGRAM
C1 / C2 ERROR CORRECTION POINTER GENERATION
PROGRAM COUNTER

IC604 CX7935

R616 10K
TP6

Q511~Q515 2SC536G
R516 22K
Q511 Q513 Q512 Q514
R511 82K
R513 10K
R512 10K
R517 47K
R518 47K
R515 47K
Q515
D511 GMA01
R514 10K
C503 100 µ/10V
C504 001
C511 2.2 µ/50V
L501 10µH
R519 5.6K

IC503 M54539
IC502 (1/2)
IC504 LC4011B
R521 47K
R522 10K
C521 0.0022
R508 1K

Q501.Q551 2SC536G
Q502 2SB598E
Q552~Q555 2SA984E
R506 1K
R507 27 (2 W)
R505 1K
R504 10K
R551 33K
C505 470 µ/16V
R552 1K
R553 1K
R554 1K
R555 1K
R556 1K
R557 1K
R558 1K
R559 1K
R560 10K
R561 10K
R562 10K
R563 10K
C551 100µ/16V
C552 100µ/16V
C553 100µ/16V
C554 100µ/16V

CN21
CN19
CN13
STEPPING MOTOR
TO SERVO
FROM POWER SUPPLY

VOLTAGE INDICATED IN STOP MODE

MODEL CP300 CP300X SCHEMATIC DIAGRAM ① (PICK-UP•SERV

SENSER PRE-AMP, SERVO & EQUALIZER

COMPACT DISC

PICK-UP

RADIAL COIL

OBJECTION LENS

FOCUS COIL

POLAROID PRISM

CRITICAL ANGLE PRISM

COLLIMATION LENS

LASER DIODE

MONITOR PHOTO DIODE

CN1

CN2

CN3

CN4

IC101 LA9000N
PRE - AMP

SUMMING AMP

HF AMP

HF DETECTOR

Q101 2SC536H

IC102
NJM4558DD

IC305 LC4011B

GMA01

D382

D383 GMA01

D384 MTZ5.1B

D381 GMA01

IC301

TP10
1(HF)
2(DL)
3(FE)
4(RE)
5(S-G)

TP1
TP2
TP3
TP7
TP9
TP13

(DL)
(HF)
(HFOK)
(NP)
(FE)
(+9V)
(S-G)
(-9V)

FOCUS OFF SET

L201
L202
DL

IC201 LA
EQUARIZE

LASER POWER

VOLTAGE INDICATE IN PLAY or STOP MODE

Q123
2SA608F

Q121
2SD612E

Q122
2SB598F

IC121
LA6358

D121 GMA01

D122 MTZ5.6C

D123 GMA01

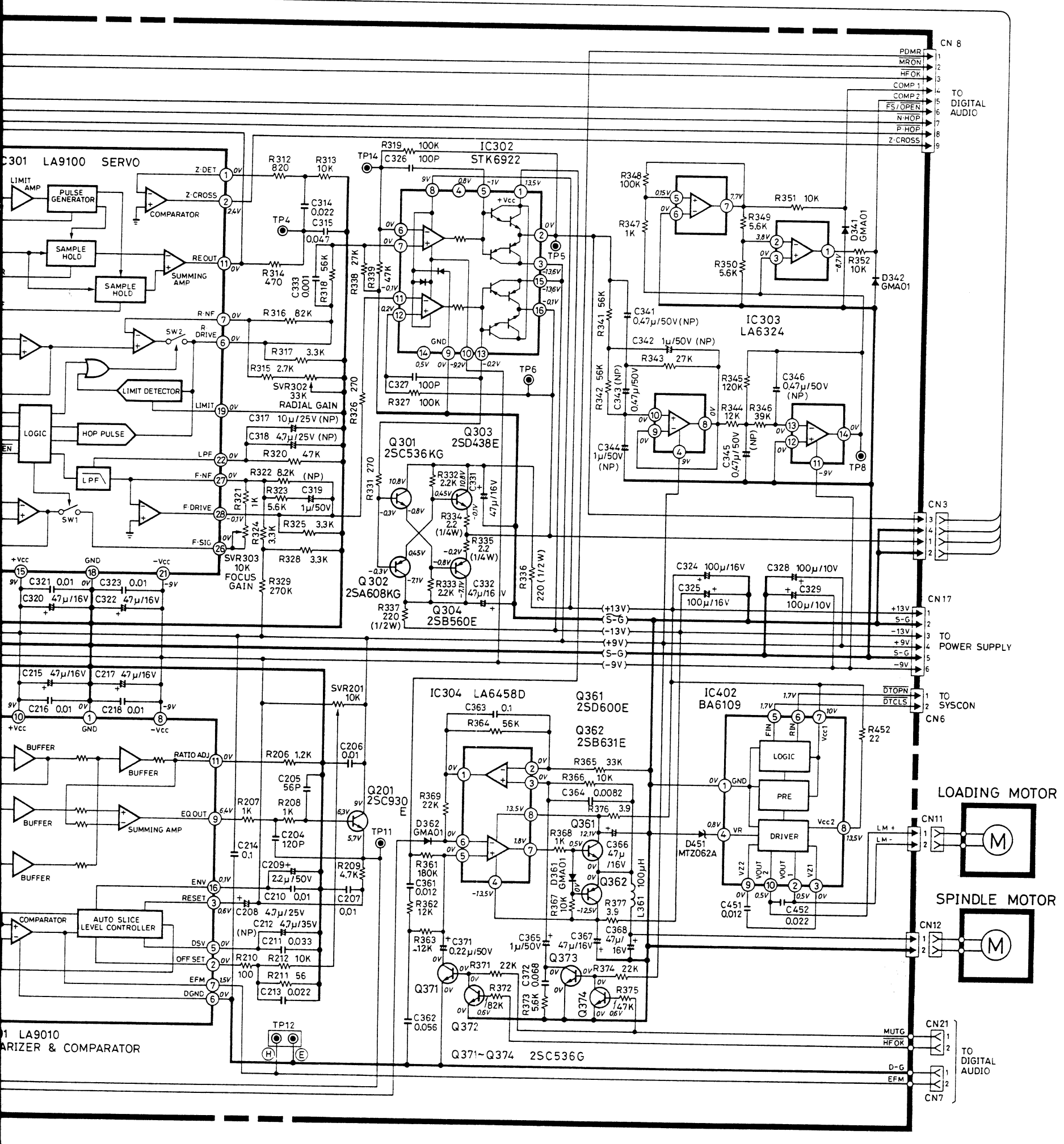
D124 MTZ12B

TAOHS
A : R130,131 CUT
B : R131 CUT
C : NO CUT

VOLTAGE INDICATE IN STOP MODE

RVO & EQUALIZER)

10 | 11 | 12 | 13 | 14 | 15 | 16 | 17



MODEL CP300 CP300X WIRING DIAGRAM② (DIGITAL AUDIO &

STEPPING MOTOR DC11V

TO LIMIT SW P.C.B.

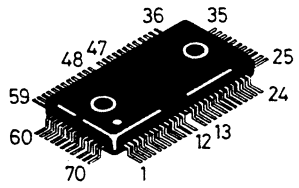
TO SYSTEM CONTROL P.C.B

TO SERVO P.C.B.

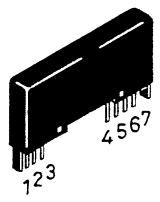
TO SERVO P.C.B

DIGITAL AUDIO P.C.B.

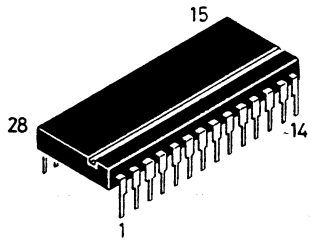
IC603.....CX7934

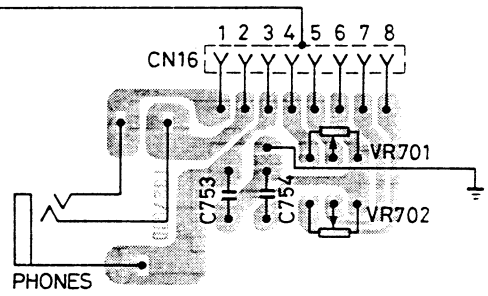


IC705
IC706 ..... AFL89WB20000C3



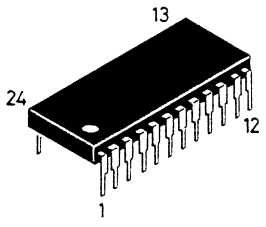
IC602 ..... CX7933
IC604 ..... CX7935



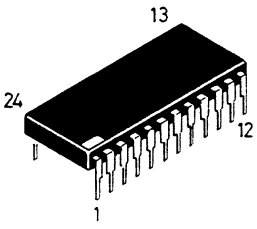


PHONES SOCKET P.C.B

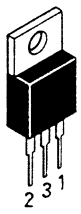
IC601..... MB62131



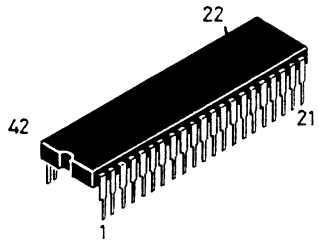
IC605..... MB8128-15



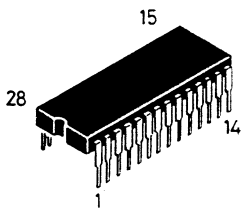
IC709 ..... NJM78L05A
IC710 ..... NJM79M05A
IC901 ..... NJM7805A
IC902
IC904 ..... NJM78M09A
IC903
IC905 ..... NJM79M09A



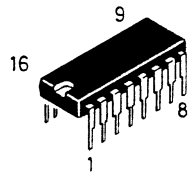
IC501..... μPD1511C-144



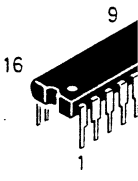
IC701..... CX20017



IC503..... M54539



IC704..... μP



O & POWER SUPPLY)

9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17

FIXING
SW P.C.B.

CN15

PL2

LAMP P.C.B.

POWER SUPPLY
P.C.B.

C923
D907
Q901
R902
R901
C924
Fu 903
Fu 902
Fu901
C904
D901
C902
C905
C903
PT
TH.FUSE
130°C
S2
PL1
POWER SW
P.C.B.
S1

R851
C851
R852
R854
Q851
C852
R857
Q852
Q853
D851
C906
D852
R853
D902
R855
R856
D853
R858
R859
C907
C908
IC901
C910
C911
C912
C915
C916
D903
D904
IC902
IC903
IC904
D905
D906
IC905
C921
C922

CN19
D-G
I+11V
I+5V
D-G

CN18
D-G
I+5V
I+11V
RESET

CN17
+13V
A-G
-13V
+9V
A-G
-9V

CN20
-13V
+13V
A-G
+9V
A-G
-9V

TO SYSTEM
CONTROL P.C.B.

TO SERVO
P.C.B.

TP2
R615
C604
R614
SVR
601
Q601
L602
D601
R607
Q602
R606
R605
R604
C603
R603
C609

IC 601

C618
C613
TP5

IC 605
IC 602

C617
C620
TP3
TP4
TP6

P.C.B.

L951

AC IN
110/220V
50Hz

Q502 ..... 2SB598
Q901 ..... 2SD400

Q501.503.511.512.513.
514.515.551.801.
802.851.852.853.....2SC536
Q602.603.604.....2SC930
Q552,553,554,555.....2SA984

IC704 .....μPD4053BC

IC606.....M74LS00P

IC502 } LC4001B
IC607 }
IC504 .....LC4011B

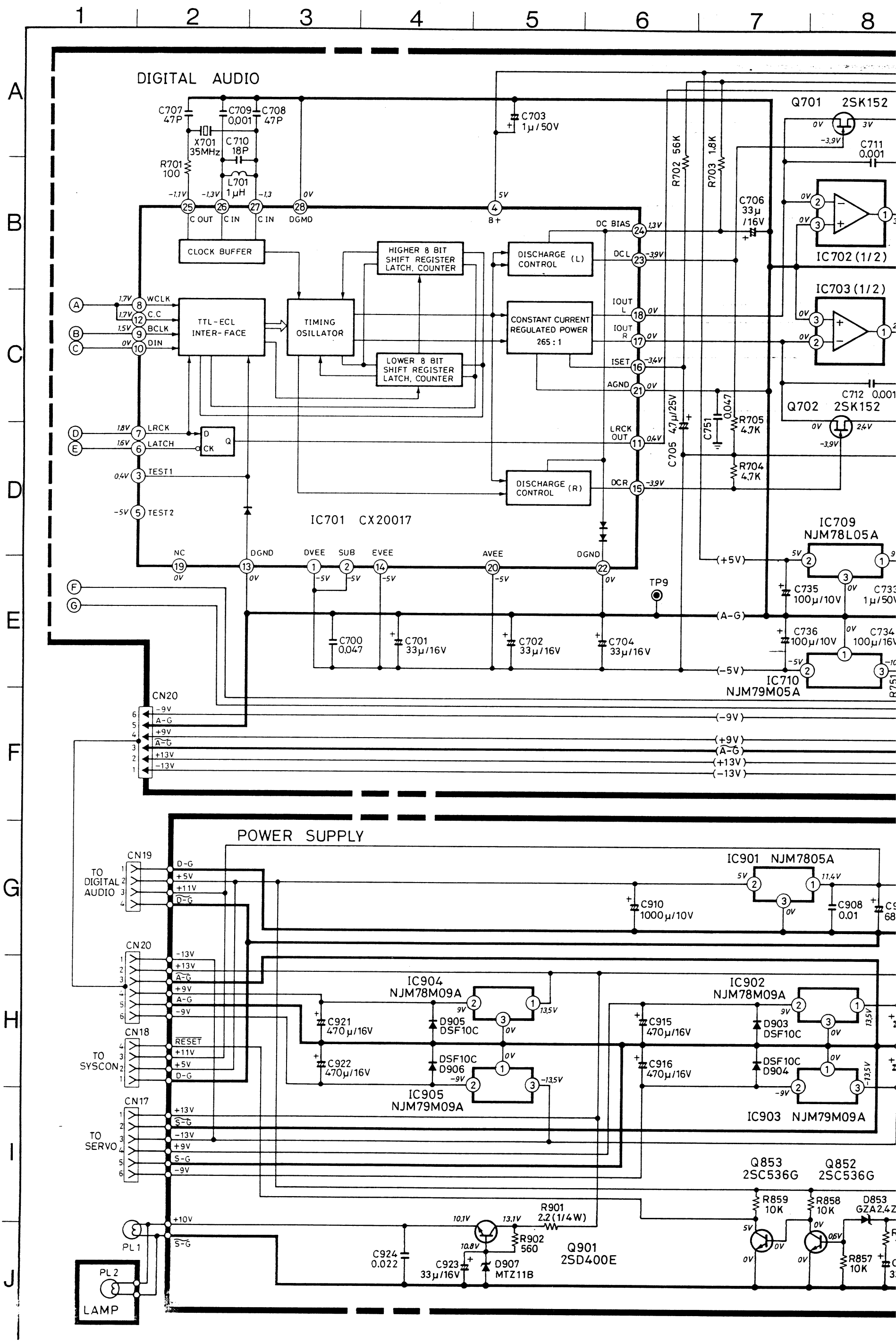
IC702 } LF353N
IC703 }

IC707 .....NE5532AP
IC708 .....NJM4556D

Q701,702.....2SK152

Q601 .....2SK222

MODEL CP300 CP300X SCHEMATIC DIAGRAM③ (DIGIT



TAL AUDIO 2 & POWER SUPPLY)

9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17

IC705 AFL89WB20000C3

IC706 AFL89WB20000C3

IC704 (1/2) μPD4053BC

IC703(1/2) LF353N

IC702(1/2) LF353N

IC705 IC706

IC707(1/2) NJM4560DD

IC708 NJM4556D

Q801 2SC536KG

Q802 2SC536KG

Q851 2SC536G

D701 MTZ6.2C

D702 MTZ6.2C

D801 GMA01

D802 GMA01

D851 GMA01

D852 GMA01

RY801

RY802

D901 DBA30C

D902 DBA20C

FU901 3.15A

FU902 1.6A

FU903 1.6A

POWER SW

S1...POWER SW

S2...VOLTAGE SELECTOR

VOLTAGE INDICATED IN STOP MODE

TH. FUSE 130°C

AC IN AC 110/220V 50Hz

LINE OUT

PHONES

CN16

VR701 50K(A) LEVEL(L)

VR702 50K(A) LEVEL(R)

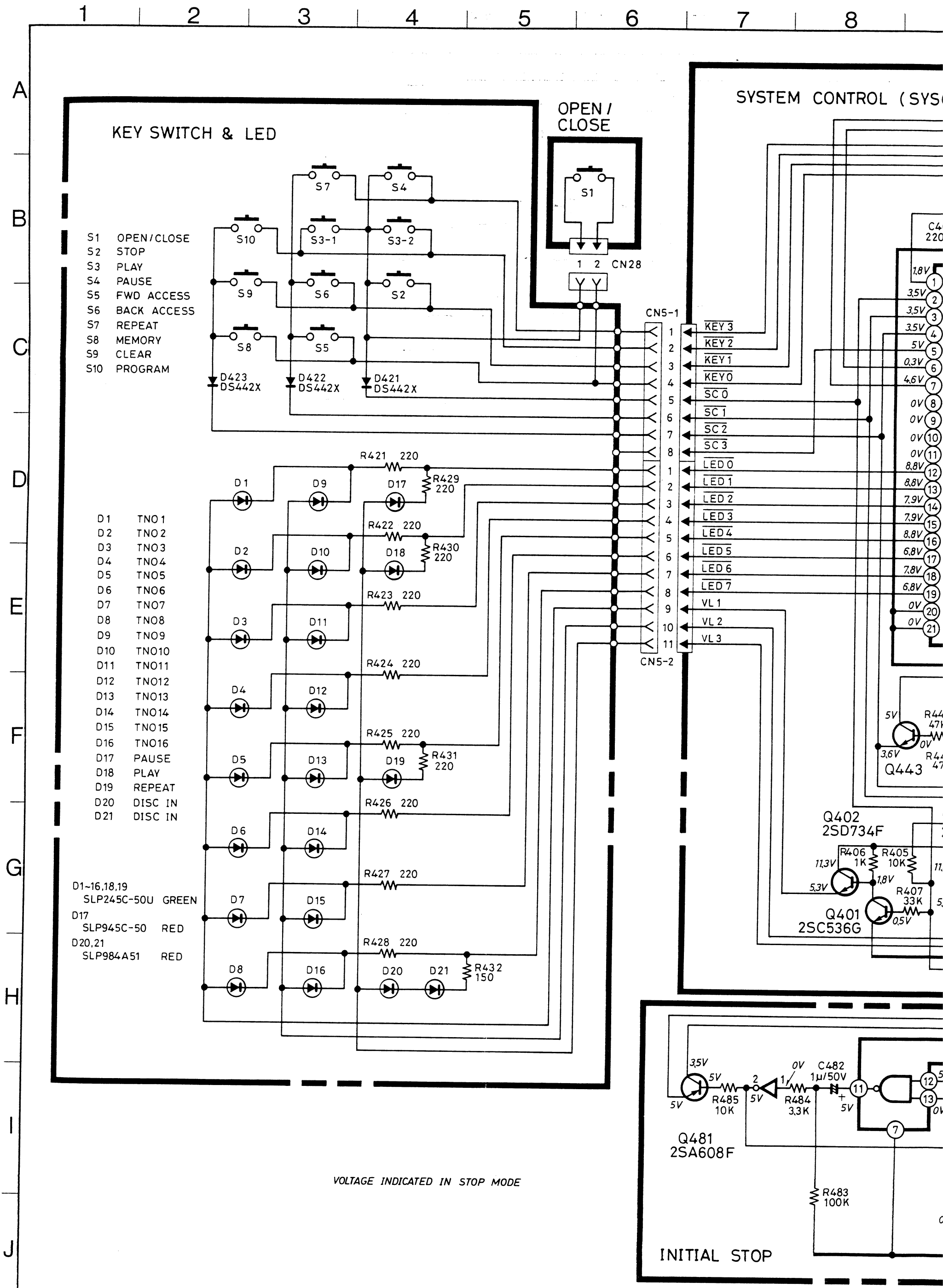
TP10

TP11

Safety notice:

All parts bearing the ⚠ symbol were manufactured to conform to special safety standards. When replacing, do not use parts numbers other than those specified.

MODEL CP300 CP300X SCHEMATIC DIAGRAM④ (SYSCON



SCON & KEY SW.)

8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17

TROL (SYSCON)

IC401 LM6402H-274

R401 1M
C401 220P
X401 800kHz
C402 220P
C408 100µ/10V
R403 10K
R404 10K
L401 10µH
R414 2.2K
RA402 10K x 7
RA401 10K x 4
D401 GMA01
R415 330
C404 0.01
C405 0.01
C406 0.01
C407 100P
C413 47µ/10V

1 XTAL 1.8V
2 SCAN 0 3.5V
3 SCAN 1 3.5V
4 SCAN 2 3.5V
5 SCAN 3 5V
6 SOK 0.3V
7 RESET 4.6V
8 0V
9 0V
10 0V
11 0V
12 LED 0 8.8V
13 LED 1 8.8V
14 LED 2 7.9V
15 LED 3 7.9V
16 LED 4 8.8V
17 LED 5 6.8V
18 LED 6 7.8V
19 LED 7 6.8V
20 TEST 0V
21 Vss 0V

42 E XTAL 2.4V
41 VDD 5.0V
40 SCK 3.3V
39 SI 1.4V
38 SO 1.3V
37 0V
36 KEY 3 5.0V
35 KEY 2 5.0V
34 KEY 1 5.0V
33 KEY 0 5.0V
32 DT CLS 1.7V
31 DT OPN 1.7V
30 REC 4.0V
29 FS 5.0V
28 LSMT 5.0V
27 HFOK 5.0V
26 4.9V
25 DISC 4.9V
24 TOPN 5.0V
23 TCLS 0V
22 LCLS 5.0V

CN9
RESET 8
INT 7
SCK 6
SI 5
SO 4
FS 3
HFOK 2
MRON 1
TO DIGITAL AUDIO

CN6
DTCLS 2
DTOPN 1
TO SERVO

DISC SW
PC-2

CN10
GND 7
DISC LED 6
DISC 5
GND 4
TOPN 3
TCLS 2
LCLS 1
S4-1 TOPN SW
S4-2 TCLS SW
S4-3 LCLS SW

CN23 1 2 3
AUTO FUNCTION SOCKET

CN18
RESET 4
+11V 3
+5V 2
D-G 1
FROM POWER SUPPLY

GMA01 D441
R444 2.7K
R446 47K
D442
R447 47K
GMA01
R445 330K
R441 33K
R442 330K
R440 33K
Q442
Q443
Q441
Q441~443 2SC536G

R443 820
Q404 2SD734F
Q406 2SD734F
Q407 2SB598F
R405 10K
R407 33K
R408 10K
R410 33K
R411 10K
R413 33K
R416 10K
R417 1K
R418 33K
Q403 2SC536G
Q405 2SC536G
C409 100µ/10V
C411 47µ/16V

Q408 2SC536G

IC403 LC4011B

CN24 1 2 3 4 5 6 7
CN25 1 2

R482 3.3K
R481 470K

IC404 LC4069UB
R486 150K
R487 3.3K
C483 1µ/50V
D481 GMA01
R488 3.3K
Q482 2SC536G
Q483 2SA608F
R490 10K
R489 10K
C481 1µ/50V
C484 0.01